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Guest Editor: Lana Vanderlee

Inside this issue

1 Editorial
Seeking a new 'normal' in the Canadian food environment

3 Commentary
What about the mouth? Connecting oral health and food environments

6 Healthy food procurement and nutrition standards in public facilities: evidence synthesis and consensus policy recommendations

18 At-a-glance
"A tough sell": findings from a qualitative analysis on the provision of healthy foods in recreation and sports settings

23 Status report
FoodReach Toronto: lowering food costs for social agencies and community groups

29 Building capacity through urban agriculture: report on the askiy project

36 Other PHAC publications

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Editorial

Seeking a new 'normal' in the Canadian food environment

Lana Vanderlee, PhD, Guest Editor (1); Erin P. Hobin, PhD, RD (2)

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Our food environment, which includes physical and social surroundings, has 'normalized' unhealthy eating behaviours in Canada. The ubiquity of unhealthy, energy dense, nutrient poor foods in the settings in which we go about our daily lives has made these foods the norm in our dietary patterns. This ease of access and affordability, coupled with high palatability and heavy marketing of less healthy food choices has established food preferences that are not in alignment with population-level dietary goals, and the result is poor diet quality among the vast majority of Canadians.[1] But what if 'healthy' became the new norm that is *expected*, *demanded*, and *preferred* from the population?

Many food preferences are malleable, and can be shaped over time by external cues.[2,3] As such, experts have identified a range of policy options that can contribute to normalizing and increasing preferences for healthier food options.[2] Some of these policy options have been explored in previous special issues on the Canadian food environment in this journal, including marketing and advertising practices, food formulation that is lower in salt, sugar and fat, and physical access to more healthy and fewer less healthy food outlets. In the last of our special issues on the food environment, the showcased articles have implications for additional policy options targeting food environments that aim to influence food access, availability and perceptions of the food system which have implications for shaping food choices and food preferences. Realistically, food environments are unlikely to change independently without public demand prioritizing nutrient-rich foods across settings; therefore, it is likely that food environments and food preferences will shift in a healthier direction somewhat concurrently, as they are mutually reinforcing. Increasing the availability of nutritious foods in our everyday lives will 'normalize' their presence and decrease barriers that discourage healthy choices, thereby shaping preferences and demand. As the public becomes more aware and informed of the importance of healthy food choices, they will increasingly demand that these choices are more readily available and affordable, and our food system will need to respond.

This issue includes a commentary by the Office of the Chief Dental Officer of Canada that describes the impact of the current food environment on oral health in Canada.[4] The piece describes the normalization of food and drinks high in added sugar (with a focus on sugar-sweetened beverages) in the diet of children, youth and young adults in Canada, and the negative impact on oral health. The article describes how creating supportive food environments that make healthier choices more available, affordable, and accessible (and therefore, more 'normal') has significant potential to decrease the burden of poor oral health, in addition to a variety of other non-communicable diseases, and reinforces the importance of oral health experts as contributors to the food environment conversation.

Changing the foods that are consistently available to consumers across settings can substantially influence food choices, as demonstrated in the paper by Raine and colleagues.[5] In particular, settings where children frequent, such as schools and recreation centres play an integral role in establishing food preferences by modelling eating behaviours, and thereby shaping social and cultural norms among this impressionable age group. Health care and other government-funded facilities serve as examples for the general public with regard to what foods they believe are acceptable to be served, as ostensibly these are the very institutions that have significant investment in population health and health care costs. The article summarizes consensus recommendations developed by thought leaders from across the country for procuring and providing healthy foods in public sector settings, and highlights the critical roles that multiple stakeholders are required to perform in successful implementation of healthy food procurement policies on a large scale.

The article by McIsaac et al. provides reflection on what the implementation of a procurement policy looks like at the local level, in this case in recreation and sport facilities.[6] The article demonstrates ingrained social norms and values with regard to the foods that are expected to be available in recreation and sports settings in Canada and consumer demand for less healthy products in these environments. It also identifies values regarding the perceived appropriateness of public venues controlling consumer food choices, and the concept of individual responsibility for food choices related to obesity. The findings highlight the shifts in cultural norms and values related to consumer demand and personal responsibility for food choices that will be required for healthy procurement policies to be implemented successfully, and how these shifts in consumer expectations may occur simultaneously as these types of policies become more commonplace across settings.

The status report by Coleman and colleagues describes a novel approach to healthy food procurement among community

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organizations with the development of the FoodReach initiative, a program that brings together small organizations to increase purchasing power for healthy, fresh food products.[7] This approach is a valuable example of how to successfully implement healthy procurement policies in small organizations. The creation of a knowledge exchange portal will also help with cross-learning from policy and program experience, which was a recommendation stemming from the expert consensus by Raine and colleagues. Finally, the FoodReach program provides an opportunity for community groups to model healthy eating behaviours in a variety of community programs, which range from school nutrition programs to child care centres, to resource centres for those experiencing homelessness.

The final article in this special issue by Martin and Vold qualitatively explores the impact of an urban agriculture project on seven First Nation and non-First Nation young adults who engaged with the project as interns.[8] The askîy project in Saskatoon, Saskatchewan, speaks to the current disconnect between the public and the mainstream food system, which is often far removed from consumers as they navigate grocery store aisles, kitchen cupboards, and restaurant menus. Agriculture projects in urban settings serve many purposes, with environmental, social, spiritual, agricultural, and food literacy implications, as the article explores. The integration of First Nations' knowledge and teachings makes this a particularly unique project, and the overall project provides an interesting template for how such programs can be integrated into local communities to reinforce involvement in food production and the overall food system, values related to local food and food sources, and attitudes towards healthy eating.

As Canada moves forward with implementing the various aspects of the *Healthy Eating Strategy*[9] and *A Food Policy for Canada*,[10] both of which have highlighted the critical importance of healthy food policies to create supportive food environments and food systems, we should be mindful of the incredible potential for policies to shift consumer mindsets towards a new, healthier 'normal.' The articles in this issue emphasize the need for more policies, tools, programs, and practices that support food system reforms to provide nutrient-rich, healthier food options consistently across settings in Canada, and provide examples of local interventions that support environmental changes to increase access, availability, and affordability of healthy foods.

As we raise our expectations for healthy foods to be universally available, promoted, and appropriately priced, we will contribute to this generation and generations in the future—demanding, preferring, and consuming diets that promote health and wellness.

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Commentary

What about the mouth? Connecting oral health and food environments

The Office of the Chief Dental Officer of Canada

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Oral health is a fundamental component of our overall health and well-being:[1]

> Oral health is multi-faceted and includes the ability to speak, smile, smell, taste, touch, chew, swallow and convey a range of emotions through facial expressions with confidence and without pain, discomfort and disease of the craniofacial complex.

Oral diseases, which range from tooth decay to gum disease to oral cancer, are among the most common and widespread diseases in Canada and worldwide.[2,3] Oral diseases share common risk factors and have causality or clinical exacerbation relationships with some of the leading chronic diseases: diabetes, cardiovascular diseases, chronic respiratory diseases and cancer. Some of the common risk factors are unhealthy diet (particularly those high in added sugars), smoking, alcohol abuse, and poor oral hygiene.[4]

Considering that what we eat and drink goes through the mouth first, the dietary choices that we make—as influenced by food access and availability, food promotion and pricing and food labelling—can have direct implications on our oral health. As highlighted by Vanderlee and L'Abbé in the September issue of this journal,[5] dietary choices go beyond the individuals. Even though we can argue that we all have a certain degree of responsibility over the food choices we make, we need supporting food environments that contribute to make the healthy options—fresh, nutrient-dense foods—attractive, available and easily accessible, at reasonable prices.

As part of Canada's *Healthy Eating Strategy*,[6] Health Canada has the vision to "Make the healthier choice the easier choice for all Canadians." The Office of the Chief Dental Officer (OCDO) of the Public Health Agency of Canada, along with the Federal-Provincial-Territorial Dental Directors Working Group (the individuals appointed as the senior government authority in oral health in each of Canada's provinces and territories) share that vision.

A lot still needs to be accomplished to achieve that goal. Health Canada notes that many food environments make it difficult for Canadians to make healthy choices due to the following:[7]

- Widespread availability of inexpensive foods and beverages high in calories, fat, sodium and sugars;
- Marketing of foods is very powerful and children are particularly vulnerable;
- There is a constant flow of changing (and often conflicting) messages;
- Canadians face challenges in understanding and using nutrition information;
- Some sub-populations in Canada face challenges in accessing nutritious foods.

The sugary and/or fatty low-cost and nutrient-poor foods and beverages are still too often the tempting and readily available options in so many places.

Sugar consumption is the most obvious example when we talk about effects on oral health. We all know that sugar is not good for our teeth—the primary risk factor for dental caries (or tooth decay) is a diet high in added sugars. In fact, there is a consistent association in scientific literature between tooth decay and higher sugar consumption. We have a clear understanding of the biological mechanism that causes tooth decay: sugar acts as a substrate for oral bacteria, leading to the production of demineralizing acids.[8,9] Some research suggests that modifying our diet, and more specifically our sugar consumption, could potentially be more effective to minimize the risk of developing tooth decay than even fluoride application.[8,9]

Soft drinks, sports and energy drinks often have large amounts of sugar and calories—a can of soft drink contains the equivalent of 10 teaspoons of sugar.[10] Sugar-sweetened beverages (SSBs) are the largest contributor of sugars in Canadians' diet, especially among teenagers and young adults. Regular carbonated soft drinks make up the largest portion of SSBs consumed by these two groups. Greater consumption of SSBs is associated with increased risk of obesity, type 2 diabetes, cardiovascular disease, kidney diseases, osteoporosis, some cancers, and tooth decay.[11]

Tooth decay affects 57% of Canadian children aged 6 to 11 years and 96% of Canadian adults over their life time.[2] This prevalence increases to 94% in First Nations and 93% in Inuit children and > 99% of First Nations and Inuit adults.[12,13] Consequences of untreated tooth decay—a fully preventable disease—may include pain, discomfort, infection, abscesses, reduced ability to speak, to socialize or eat, time lost from work and school, it can also lead to lower self-esteem and confidence and potential

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discrimination (based on dental appearance). It is an economic burden on the health care system (2nd largest health care expenditures after medications/drugs—oral health expenditures are greater than 13 billion annually).[14] In Canada, dental procedures are the leading cause of day surgery for children aged 1 to 5. Each year over 19000 day surgery operations—mostly due to tooth decay—are performed under general anesthesia, with disproportionate representation of Indigenous children.[15]

As with our general health, our oral health is influenced by social determinants, including our socioeconomic status, our level of education, where we live, food security, and access to care.[16]

The burden of oral diseases thus disproportionately affects vulnerable populations such as the elderly, low income, adolescents, Indigenous people (rural or isolated), new Canadians, and the mentally or physically challenged.[1] There are particular concerns over access barriers to healthy nutritious foods for vulnerable populations and the effects on their oral health and overall health. Low socioeconomic status has been linked to the consumption of higher amounts of unhealthy food and drinks, and people who are food insecure will eat fewer fruits and vegetables and have less variety in their diet.[17]

In order to make the healthy choices the preferred choices for all, the healthy options that can have a positive impact on people's oral health and overall health and well-being need to be made attractive and more broadly available, affordable and accessible. This is the focus of this special issue of the journal: looking at the current situation in different public venues where people consume food and drinks, proposing avenues for improvement, and exploring the potential impacts of specific programs or initiatives to ensure better access to healthy options, especially for vulnerable populations.

It is important to work together to consolidate what already works, and to find new and improved ways to promote healthy habits and healthier food environments. In doing so, we should keep in mind that, in the overall picture of general health and well-being, oral health is an integral piece of the puzzle. The mouth matters. Research, policies, programs and interventions related to food, diet, nutrition and food environments should, ideally, develop the reflex of thinking about the connections to oral health, and the oral health community should be a part of those conversations.

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Healthy food procurement and nutrition standards in public facilities: evidence synthesis and consensus policy recommendations

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This evidence synthesis has been peer reviewed.

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Abstract

Introduction: Unhealthy foods are widely available in public settings across Canada, contributing to diet-related chronic diseases, such as obesity. This is a concern given that public facilities often provide a significant amount of food for consumption by vulnerable groups, including children and seniors. Healthy food procurement policies, which support procuring, distributing, selling, and/or serving healthier foods, have recently emerged as a promising strategy to counter this public health issue by increasing access to healthier foods. Although numerous Canadian health and scientific organizations have recommended such policies, they have not yet been broadly implemented in Canada.

Methods: To inform further policy action on healthy food procurement in a Canadian context, we: (1) conducted an evidence synthesis to assess the impact of healthy food procurement policies on health outcomes and sales, intake, and availability of healthier food, and (2) hosted a consensus conference in September 2014. The consensus conference invited experts with public health/nutrition policy research expertise, as well as health services and food services practitioner experience, to review evidence, share experiences, and develop a consensus statement/recommendations on healthy food procurement in Canada.

Results: Findings from the evidence synthesis and consensus recommendations for healthy food procurement in Canada are described. Specifically, we outline recommendations for governments, publicly funded institutions, decision-makers and professionals, citizens, and researchers.

Conclusion: Implementation of healthy food procurement policies can increase Canadians' access to healthier foods as part of a broader vision for food policy in Canada.

Keywords: policy, obesity, chronic disease, food procurement, nutrition guidelines, public facilities

Highlights

- Unhealthy foods are widely available in public settings across Canada.
- Healthy food procurement policies, which support procuring, distributing, selling, and/or serving healthier food in public settings, have emerged as a promising strategy to promote healthier food environments.
- Healthy food procurement policies may positively impact sales, intake, and availability of healthier food.
- A consensus conference was held in September 2014 to develop expert recommendations for healthy food procurement in Canada.
- Consensus recommendations outline roles for governments, publicly funded institutions, decision-makers and professionals, citizens, and researchers in implementing healthy food procurement policies as part of a broader vision for Canadian food policy.

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Introduction and background

Unhealthy foods, particularly those high in sugar, salt and saturated fats, have become widely available in public settings across Canada, including schools, recreation facilities, workplaces, and health care facilities, contributing to societal health issues, such as obesity and chronic disease.[1-3] This is concerning as public facilities provide significant amounts of food for consumption by vulnerable populations, such as children and seniors.[4] Promoting healthier food environments in public settings may help mitigate adverse health outcomes.[5]

The development and adoption of healthy food procurement policies and/or nutrition standards have emerged as promising strategies to tackle societal health issues associated with unhealthy food environments by increasing access to healthier foods in public settings.[6,7] Healthy food procurement refers to the process of procuring, distributing, selling, and/or serving food to facilitate healthier dietary behaviours.[8] Nutrition standards/guidelines help determine the types of food obtained and purchased throughout these processes.[8] While precise definitions of "healthy" foods vary, generally, nutrition standards promoting healthier foods would minimize foods high in sugar, salt and saturated fats, while promoting fruits and vegetables, whole grains, and lean protein.[9]

As stewards of public institutions and funds, municipalities around the world have taken action to promote healthy choices through healthy food procurement policies. In 2009, New York City (NYC) introduced the *NYC Standards for Meals/Snacks Purchased and Served*. These *Standards* influence, directly or through city contracts, an estimated 260 million meals and snacks provided annually at more than 3000 sites.[4] At the time, these *Standards* were the first to outline nutrition recommendations covering all government-purchased foods.[4] In 2010, the Los Angeles County Department of Public Health similarly launched several initiatives to increase healthy food procurement in selected institutions.[8] Targeted institutions incorporated new or updated existing nutrition standards and recommended practices related to food services and vending machines. However, these standards/practices varied by institution according to their specific priorities.[8]

A few Canadian municipalities/regions have adopted healthy food procurement strategies, such as the Region of Peel[10] and City of Hamilton in Ontario.[11] In Toronto, healthy food procurement projects have been implemented through the *Toronto Food Strategy*, including transforming convenience stores into "healthy corner stores" to increase healthy food accessibility in underserved communities.[12] In addition, Canadian jurisdictions have introduced policies, mandatory and voluntary, in settings such as schools[13-15] and recreational facilities.[16] Concerning workplaces, Hypertension Canada developed a free online tool, entitled the "4 STAR Food Environment Program," to help employers develop healthy food environments.[17]

Opportunities and challenges

Prominent Canadian health and scientific organizations have called for implementation of healthy food procurement policies by governmental and non-governmental organizations.[18] The 2015 election of the Liberal government arguably opened a window for change, given their expressed interest in addressing social determinants of health,[19] which include food accessibility.[20] Recently, survey data have shown public and decision-maker support for improving "obesogenic" food environments.[21-23] The Standing Senate Committee's obesity report also acknowledged that obesogenic environments facilitate poor eating behaviours, thereby challenging Canadians to make healthy choices.[24] In October 2016, Health Canada addressed these priorities by announcing their vision for improving food environments in Canada's "Healthy Eating Strategy."[25]

Despite recommendations, healthy food procurement policies have not been broadly implemented in Canada. This may be due to issues and challenges hindering implementation, such as limited knowledge of potential positive impacts.[6] Additional factors, such as logistical barriers (e.g. lack of cooks or kitchens in schools), financial issues (pressures to create revenue streams from food service and/or franchising), and inconsistent nutrition standards and policies may be further impediments to change.[26-28] It is important to note that public facilities serving vulnerable populations, such as schools and hospitals, may call for stricter procurement criteria than those frequented predominantly by healthy adults.[29] Nutrition standards and policies may also need to be adapted to local contexts based on differing cultural, social, and spiritual values.[29,30] Similarly, a universal approach to change may not suit all settings. For example, the use of choice architecture or nudging[31] may help to promote healthy choices through subtle environmental cues, particularly with populations that prefer slower, progressive approaches to change.[28] Alternatively, regulatory approaches involving stricter implementation guidelines may more effectively promote healthy choices in other settings.[32]

A key duty of government is to provide conditions that facilitate healthy choices on the part of citizens.[33] However, with unhealthy options flooding the food environment, Canadians are not always supported to do so.[24] As public stewards, governments are obliged to intervene when current conditions damage health.[33] In taking action on healthy food procurement, examples exist of top-down (e.g. NYC Standards for Meals/Snacks Purchased and Served[4]) and bottom-up (e.g. Toronto Food Strategy[12]) approaches to change. Integrating both top-down and bottom-up strategies has been deemed beneficial[34] to sustain public engagement and avoid unsustainable changes made primarily for political gain.[35] Additional benefits of such integrated approaches to healthy food procurement are the novel opportunities it affords for progressive collaboration with the food industry.[36] In light of the significant role that industry plays in food production and distribution, these innovative partnerships can strengthen healthy food procurement initiatives.

Objectives: the next best steps

To inform action on healthy food procurement in Canada, we hosted a consensus conference with public health and food procurement experts in Edmonton, AB in September 2014 to craft recommendations for action across multiple sectors. In preparation for this consensus conference, we conducted an evidence synthesis informed by a rapid review approach to explore the impact of healthy food procurement policies and nutrition standards on sales, intake, and availability of healthier food, as well as indicators of health and of weight status (overweight/obesity). The purpose of this paper is to summarize findings from the evidence synthesis and to describe the consensus conference process and emergent recommendations. In

the interest of rapid dissemination to practitioners and policy-makers, an earlier version of the evidence synthesis and preliminary recommendations were reported on the website of the Alberta Policy Coalition for Chronic Disease Prevention, a partner in a funded project on policy interventions to address obesity and chronic diseases.[37,38]

Methods: evidence synthesis approach

Development of the evidence synthesis was informed by a rapid review approach. The rapid review approach is an emerging methodology that allows for the timely synthesis of information, which is often required by decision-maker and stakeholder audiences.[39] As outlined by Khangura et al.,[39] evidence syntheses developed using a rapid review approach can serve as a useful tool to prepare stakeholders for discussion on a policy issue, such as a consensus conference. While methodologies vary, rapid reviews often focus on a specific topic of interest, limit the number of databases searched, and occur at the review level.[39-41]

Our evidence synthesis collected comprehensive or systematic reviews from two databases (Ovid Medline and CINAHL) and three grey literature sources (UConn Rudd Center for Food Policy & Obesity website,[42] National Center for Disease Control and Prevention [U.S.] website,[43] and the Public Health Agency of Canada website[44]). An information specialist, well versed in the rapid review approach, designed and executed the literature search. An example of search terms used in CINAHL included: (beverage* or food* or meal* or nutrit*), (distribut* or procure* or purchas* or sell*), (guideline* or policy or policies or standard*), and (health* or obes* or weight*); detailed search methodology is available upon request from the authors. Inclusion criteria were: (a) French or English reviews published between January 2003 and July 2016; (b) reviews identified as comprehensive or systematic in nature, outlining specific methods and inclusion/exclusion criteria; (c) reviews that examine the impact of healthy food procurement policies/programs and/or nutrition standards on sale, intake and/or availability of healthier food, and/or on health, obesity or weight status; (d) reviews that focus predominantly on public facilities. The first and second round of screening involved reviewing titles and abstracts, respectively, to remove irrelevant studies. The third-level screening consisted of a full-text review of remaining articles to ascertain relevance to inclusion criteria. Data were extracted by one individual, and reviewed by a second. Two individuals rated the quality of included reviews using the AMSTAR appraisal tool.[45] While the initial search was conducted in June 2014, an updated search was performed in July 2016 to capture additional reviews.

Results: synthesis of evidence

Characteristics of systematic/comprehensive reviews

Five reviews met inclusion criteria.[6,46-49] Review characteristics are outlined in Table 1. This synthesis reports on outcomes of interest described earlier. The first review by Niebylski et al.[6] included 34 studies, and focused on impacts of healthy food procurement policies/programs on sales, intake, and availability of healthier food, and BMI as an indicator of body weight status. The second review by Jaime and Lock[47] reported on 18 studies, and explored impacts of school food and nutrition policies on sales, intake, and availability of healthier food, as well as menu composition and BMI.[47] The third review by Chriqui et al.[46] included 24 studies, and examined the influence of state and district-level competitive food and beverage (CF&B) policies in schools on sales, intake, and availability of healthier food, and BMI. In this review, competitive food and beverages refer to items high in fats, added sugars, and calories[46], widely available in schools. The fourth review by Driessen et al.[49] included 16 studies and focused on isolated school food environment interventions, with outcomes related to eating behaviours (including food purchasing) and BMI. Thirteen studies overlapped in these four reviews, resulting in 76 total unique studies. The fifth review by Afshin et al.[48] assessed 73 articles (individual studies were not reported), which evaluated the effectiveness of school procurement policies in effecting dietary change. Three reviews[46,47,49] were judged to be moderate quality, receiving five out of 11 possible points using AMSTAR criteria.[50,51] Two reviews[6,48] were judged to be low quality, receiving between zero to two out of 11 points. Due to the limited number of reviews overall, low and medium quality reviews were included in the synthesis. However, findings should be interpreted with caution.

Impact in schools

In contrast to other settings, a significant body of research has focused on impacts of healthy food procurement policies/programs and/or nutrition standards in schools. In total, reviews included 120 articles related to schools, with 23 articles included in two or more reviews.

Sales and intake of healthier food

All reviews discussed impacts of healthy food procurement policies/programs and/or nutrition standards on sales or intake of healthy/unhealthy food.[6,46-49] Concerning sales, Niebylski et al.[6] found that healthy food procurement strategies in schools, paired with price reductions or education, increased healthier food sales. Regarding food intake, all reviews suggested healthy food procurement policies/programs and/or nutrition standards can promote healthy food consumption and/or decreased unhealthy food consumption.[6,46-49] In Chriqui et al.'s review,[46] CF&B policies were associated with reduced in-school consumption of unhealthy food and beverages, although results for overall consumption were mixed. Driessen et al.'s review[49] emphasized that stand-alone food environment interventions, without additional education or promotion, appeared effective in improving eating behaviours. The authors highlighted the importance of this finding, given the comparative ease in implementing such interventions.[49] However, in Niebylski et al.'s review,[6] findings were stronger for interventions that involved healthy food procurement paired with additional strategies, such as education or price reductions.[6]

Availability of healthier food

Results from reviews indicated that healthy food procurement policies, programs, and/or nutrition standards can positively influence healthy food availability in schools.[6,46-49] Niebylski et al.[6] outlined a number of school-based healthy food procurement interventions that increased healthy food availability.[52,53] Further, Jaime and Lock[47] found that in all cases, nutrition guidelines led to increased availability (i.e. provision of more servings at a meal) of fruit and vegetables (ranging from +0.28 servings/day to +0.48 servings/day). This review also found that in three of four cases, nutrition

TABLE 1
Characteristics of reviews evaluating the impact of food procurement policies/programs and/or nutrition standards

Authors	Years	Study design	Number of studies included	Types of studies included	Setting of studies	Location of studies	Outcome types	AMSTAR ranking
Afshin et al. (2015)[46]	1980–2013	Comprehensive review examining the impact of school nutrition standards and procurement policies	n = 73[a]	Randomized or quasi-experimental studies	Schools (n = 73)	Not specified in article	Intake of healthier food; availability of healthier food; BMI	0/11 (weak)
Niebylski et al. (2014)[6]	1965–2012	Comprehensive review examining the impact of healthy food procurement policies and programs	n = 34	Randomized and non-randomized controlled trials; prospective and retrospective studies	Schools (n = 19); worksites (n = 6); hospitals and other settings (n = 6); remote communities (n = 3)	Canada (n = 6); U.S. (n = 21); England (n = 3); Scotland (n = 1); Denmark (n = 1); Ireland (n = 1); U.K. (n = 1)	Sales of healthier food; intake of healthier food; availability of healthier food; BMI	2/11 (weak)
Chriqui et al. (2014)[44]	2005–2013	Systematic review examining the impact of competitive food and beverage policies	n = 24	Cross-sectional studies; longitudinal studies; combination of cross-sectional and longitudinal studies	Schools (n = 24)	U.S. (n = 24)	Sales of healthier food; intake of healthier food; availability of healthier food; BMI	5/11 (moderate)
Driessen et al. (2014)[47]	2006–2013	Systematic review examining the impact of food environment interventions	n = 16	Randomized trials; prospective studies; cross-sectional studies	Schools (n = 18)	U.S. (n = 14); U.K. (n = 4)	Sales of healthier food; intake of healthier food; availability of healthier food; BMI	5/11 (moderate)
Jaime and Lock (2009)[45]	1991–2007	Systematic review examining the impact of nutrition policies	n = 18	Randomized and non-randomized controlled and uncontrolled trials; cross-sectional studies	Schools (n = 18)	U.S. (n = 11); Europe (n = 7)	Sales of healthier food; intake of healthier food; availability of healthier food and menu composition; BMI	5/11 (moderate)

Abbreviations: BMI, body mass index; U.K., United Kingdom; U.S., United States.

[a] This paper reports on articles, not individual studies.

guidelines contributed to significant decreases in total and saturated fat on school menus.[47] Chriqui et al.[46] found that CF&B policies decreased availability of unhealthy food and beverages, with most studies reporting results in the expected direction. However, CF&B policies aimed at reducing availability of unhealthy items did not always translate into increased healthy food availability.[54]

BMI

Findings related to the impact of healthy food procurement policies/programs and/or nutrition standards in schools on BMI were limited and mixed.[46-48] Reviews by Niebylski et al.[6] and Jaime and Lock[45] each included one study relevant to this area, with neither intervention significantly impacting BMI.[53,54] In contrast, the Chriqui et al.,[46] Afshin et al.,[48] and Driessen et al.[49] reviews reported mixed findings related to BMI, with three studies reporting results in the expected direction (reduced odds of obesity or overweight)[57-59] and seven reporting a mix of significant and non-significant results, and/or unexpected results (increased odds of obesity).[60-66]

Impact in workplaces

The Niebylski et al.[6] review included six studies exploring the effectiveness of healthy food procurement policies/programs in workplaces on sales, intake, and/or availability of healthier food.

Sales and intake of healthier food

Six studies examined the impact of healthy food procurement policies/programs on sales and intake of healthier food in workplaces. Findings related to sales of healthier food were mixed, while

those related to intake were positive.[6] Regarding sales, one intervention added low-fat snacks to 55 vending machines and subjected them to four price conditions (price reductions of 10%, 25%, and 50%), significantly increasing low-fat snack sales in adults and adolescents compared to a usual price comparison condition. While all levels of price reduction led to significant increases in purchases, the largest price reductions were associated with the greatest sales increases.[67] In contrast, sales of healthful entrées were unchanged in one Kansas workplace cafeteria when healthier entrées were introduced.[68] In terms of food intake, several multicomponent workplace interventions involving healthy food procurement and strategies such as education reported significantly increased fruit and vegetable intake and reduced fat intake.[69-72]

Availability of healthier food

One study reported on outcomes relevant to healthy food availability. This study examined changes in fruit and vegetable consumption after an intervention that aimed to improve quality of lunches in five worksite canteens.[69] It also included staff training, goal setting, and support groups.[69] The study found that all five canteens, in both public and private settings, served significantly more fruit and vegetables per day at follow-up (70-g average increase per customer from baseline).[69]

Impact in hospitals, care homes, correctional facilities, government institutions and miscellaneous settings

Three studies in the Niebylski et al. review[6] explored impacts of healthy food procurement policies/programs in hospitals, care homes, correctional facilities, government institutions, and other settings.

Sales and intake of healthier food

All three studies found that healthy food procurement policies/programs increased healthy food intake. For example, one study that implemented a hospital catering initiative to increase provision of nutritious food and decrease provision of foods high in sugar, fat, and salt, resulted in significantly lower intakes of total sugars and fats, saturated fat, and salt in intervention participants.[6,73]

Impact in remote communities

The Niebylski et al.[6] review included three studies examining the impact of healthy food procurement policies/programs on sales and intake or availability of healthier food in remote communities.

Sales and food intake

All three of the above studies reported impacts on food sales or intake. The Food Mail Project program, which aimed to reduce costs of healthy perishable food and improve nutrition, resulted in increased healthy food purchases across all communities.[6,74] The second study involved a retail-based intervention to promote healthier grocery store environments in Northern First Nations and Inuit communities in Canada.[6,75] In this study, increasing the availability and affordability of 32 targeted food items along with providing educational resources resulted in increased healthy food sales, although this increase was not maintained when promotional activities ended.[6,75] The last study focused on the Healthy Food North program, a culturally appropriate nutrition and physical activity intervention, and resulted in decreased intake of calories and carbohydrates.[6,76]

Availability of healthier food

The Healthy Food North Program and Food Mail Project demonstrated that it is possible to increase healthy food availability in remote communities despite logistical challenges.[6] In the Food Mail Project, household survey respondents in two communities reported that fresh fruit and vegetables were more available post-intervention, while respondents from a third community reported no change in food availability.[74]

Discussion

Findings indicate that healthy food procurement policies/programs and/or nutrition standards can result in positive outcomes related to availability, sales and intake of healthier food, while findings related to health status (in particular BMI) were mixed.[6,46-49] Evidence of effectiveness in these areas was particularly strong in school settings.[6,46-49] Overall, the strength of the evidence regarding impact of healthy food procurement policies was limited by evidence gaps for certain settings (e.g. remote communities) and outcomes (e.g. BMI), as well as the lack of rigorously designed studies.[6,46,49]

Several factors limited the strength of included reviews. For example, most studies were conducted in developed countries, such as the U.K., Canada, and the U.S.[6,47-49] Further, few studies were conducted in settings such as hospitals, care homes, and remote communities. Many included studies reported on multicomponent interventions, making it challenging to assess the specific impact of healthy food procurement.[6] In addition, reviews reported difficulty identifying healthy food procurement policies in the literature.[6,47] One reason for this may be that, while several jurisdictions worldwide have implemented policies, such policies may not have been evaluated[6,47] or published in peer-reviewed journals.[6] Another potential limitation is the lack of longitudinal research. It is also important to note that the reviews by Niebylski et al.[6] and Afshin et al.[48] were deemed to be of poor quality based on their AMSTAR rankings. Thus, their findings should be interpreted with caution.[50,51] Finally, while the rapid review approach allowed for the synthesis of information in a timely manner, there are notable limitations compared to a systematic review.[39] For example, our methods did not have as much rigor as a systematic review, opening up to the potential for greater degrees of bias and error.[39] Finally, the search strategy may not have been comprehensive enough to capture all literature pertaining to outcomes of interest, potentially excluding relevant reviews. Future syntheses could explore strategies for increasing rigour, such as following an explicit framework for the development of rapid reviews and including only high quality systematic reviews.[39,77]

Methods: consensus process

To inform action on healthy food procurement in Canada, we hosted a consensus conference with public health and food procurement experts in Edmonton, AB in September 2014. The conference was a deliverable to a funded project on policy interventions to address obesity and chronic diseases.[78] The goal of the conference was to reach consensus and to craft recommendations for action across multiple sectors. In preparation for this consensus conference, the evidence synthesis[37] was distributed to all invited participants for review. The consensus conference brought together experts from Canada, the USA and Australia to review the evidence on healthy food procurement and share key stakeholders' experiences related to

implementation of healthy food procurement policies and nutrition standards. Members of the funded project's Policy Advisory Committee were also invited participants.

To set the stage, the conference opened with presentations from invited experts* in research, practice (particularly those with experience implementing procurement policies), and policy fields. Presentations touched upon justification for healthy food procurement policies by researchers (NC, KR), development of nutrition standards by a researcher with previous high level government/regulatory experience (ML), barriers and facilitators to adoption and implementation of healthy food procurement policies in provincial (LM), and municipal (BC, AL, DM) contexts. These practice-based presentations included representation from those responsible for implementing the sentinel *NYC Standards for Meals/Snacks Purchased and Served* (AL), as well as two of Canada's leading municipalities with respect to healthy food procurement; Toronto (BC) and the Region of Peel (DM). Adoption and implementation experience was also shared by those working in unique settings, including schools (DB), universities (JM), health care (SB), and sports and recreation (DO) contexts. Additionally, presentations and discussions highlighted key lessons learned, such as the need for intersectoral collaboration, multi-pronged approaches involving environmental and educational components, legal and regulatory implications (JSh), and stakeholder engagement (JSt) from intervention design through to implementation and evaluation. Drawing from these presentations and findings from the evidence synthesis, an experienced facilitator led group discussions around targeted questions (e.g. what is needed to move healthy food procurement forward with different stakeholder groups?). The discussions established consensus and developed recommendations around effective and feasible strategies for implementing these policies in Canada. Draft recommendations were edited for clarity by the organizers. Participants reviewed and approved the final recommendations via electronic communications.[28] Highlights from the consensus conference were documented in a video.[28]

Results: consensus statement

Despite potential barriers to implementation of healthy food procurement policies, governments are compelled to provide environments that allow citizens to make healthy choices. Consensus discussions revealed that although future research is still needed to understand the impact of healthy food procurement, there is ample evidence to support policy action in this area.

The consensus statement outlines recommendations for healthy food procurement and nutrition standards in Canada, encouraging all publicly funded institutions to implement healthy food procurement policies as part of a broader vision of food policy that promotes health, environmental sustainability, and supports local economies.

Key recommendations for government, publicly funded institutions, health care facilities, decision-makers and professionals, citizens, and researchers are outlined in Box 1.

Conclusion

Healthy food procurement policies in public facilities can promote environments that facilitate healthy choices. The consensus statement reflects a synthesis of the evidence from peer-reviewed literature, along with experiences that were shared and discussions at a consensus conference with experts from the public health community. Evidence synthesis findings showed that healthy food procurement policies can positively impact sales, intake, and availability of healthier food, though findings related to BMI varied.[6,44,47] Stakeholder experiences emphasized the role of contextual factors, such as institutional history, stakeholder engagement, and high-level support, in ensuring successful development and implementation of healthy food procurement policies. Offering healthy foods in public settings normalizes healthy eating in different contexts and contributes to a broader public health goal of creating equitable access to healthy food and improving the quality of citizens' diets. We propose that governments take a leadership role in mandating healthy food procurement policies. But, the participation of a range of stakeholders (e.g. publicly funded institutions, health care facilities, the food industry, decision-makers, professionals, citizens, and researchers) is essential to moving forward with recommendations. The recommendations herein provide concrete steps for governments, institutions, and civil society to increase Canadians' access to healthier foods through healthy food procurement policies.

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Conflicts of interest

The authors declare that they have no conflicts of interest.

Authors' contributions and statement

All authors reviewed and approved the final manuscript. All authors except ARF participated in the consensus conference. KDR contributed to drafting the evidence synthesis, chaired the consensus conference, drafted recommendations and contributed to drafting and finalizing the manuscript; KA led the evidence synthesis, drafted recommendations and contributed to drafting and finalizing the manuscript; ARF drafted the manuscript, CN contributed to drafting the evidence synthesis; DLO edited the manuscript; DLO, DB, SB, NC, BC, ML, AL, DM, JM, JSh and JSt presented evidence at the consensus conference as described in the "Consensus Process" section.

The content and views expressed in this article are those of the authors and do not necessarily reflect those of the Government of Canada.

* Presenters are included in the list of authors. Initials represent the authors who presented on the topic indicated in the text.

BOX 1
Key recommendations

All levels of government

Governments are responsible for stewardship of public funds and ensuring that food and beverages purchased promote the health of the population served. As such, all levels of government are urged to show leadership within their own institutions and facilities, as well as in institutions and facilities receiving public funds, by adopting and implementing mandatory healthy food procurement policies.

We recommend that all levels of government:

- Support implementation of healthy food procurement policies through:
  - Innovative funding models, including the provision of transition funds, subsidies, and incentives, to organizations that adopt healthy food procurement policies
  - Funding to support innovation through pilot projects, implementation and evaluation research, and knowledge translation to create an actionable evidence base
  - Long-term dedicated resources, such as technical expertise, to support policy implementation

Federal government

To support the implementation of healthy food procurement policies (both internal and external to government), we recommend that the federal government:

- Support and facilitate the development of standards and practices for healthy food procurement*:
  - Establish a nutrition profiling system to enable assessment of whether products meet an agreed-upon definition of "healthy" for procurement standards
  - Develop a repository of implementation experiences and best practices in healthy food procurement for jurisdictions across Canada

Provincial and territorial governments

We recommend that provincial and territorial governments:

- Adopt federal healthy food procurement standards, recognizing the need for flexibility with respect to cultural and geographic context
- In provinces where implementation of nutrition guidelines is voluntary, move toward mandatory healthy food procurement policies, at minimum, in settings where vulnerable populations are present (e.g. where decision-making capabilities are underdeveloped or impaired, such as daycares, schools, and long-term care facilities)
- Integrate healthy food procurement policies into accreditation standards for institutions subject to accreditation (e.g. daycares, long term care facilities)
- Provide technical expertise from the health sector to support jurisdictions and institutions in implementing, monitoring, and evaluating healthy food procurement policies, including developing and regularly updating a list of acceptable vendors and products that meet healthy food procurement standards

Regional and municipal governments

We recommend that regional and municipal governments:

- Move toward mandatory healthy food procurement policies, at minimum, in settings where children and youth gather (e.g. schools, recreation facilities)
- Create or support food policy councils that adopt and monitor healthy food procurement policies within a broader food policy mandate
- Support healthy food procurement from local providers when feasible
- Consider municipal regulations providing buffer zones excluding unhealthy food sales nearby schools

Continued on the following page

BOX 1 (continued)
Key recommendations

Publicly funded institutions

We recommend that publicly funded institutions (e.g. hospitals, schools, universities, prisons):

- Develop healthy food procurement contracts that adhere to nutrition standards, encompassing all food and beverages served within the institution, including third-party vendors (e.g. franchises, pouring rights contracts, fundraising)
- Leverage contracts as motivators for organizational change, such as:
  - Develop or modify institutional procurement policies to ensure all future contracts adhere to healthy food procurement policies and nutrition standards
  - Terminate non-compliant contracts, or renegotiate existing contracts, where feasible
  - Use expertise from food services to inform technical criteria for contracts and food purchasing
  - Frame healthy food procurement policies as an investment in quality service delivery to boards and senior administration
  - Seize opportunities for aggregated healthy food procurement among consortia of small institutions/facilities
- Dedicate staff time to implementation and monitoring compliance with healthy food procurement policies
- Collaborate with vendors to develop, stock, and store products that meet nutrition standards. This includes:
  - Framing procurement as a benefit to vendors (e.g. filling a growing market niche, supporting local economies)
  - Applying penalties for vendors' noncompliance with healthy food procurement policies

Health care facilities

Whereas health care facilities (e.g. hospitals, health care system organizations) are providers of health care services and places of health and healing:

- Act as role models for public and private institutions by vigilantly supporting the development and implementation of healthy food procurement policies
- Given that meals are medically necessary hospital services under the Canadian Health Act, re-classify nutrition and food services from operations (cost focus) to patient care (health focus)

Decision-makers and professionals

We recommend that decision-makers and professionals:

- Engage and involve citizens, students, parents, and vulnerable populations in informing the development and implementation of healthy food procurement policies at both public and private institutions
- Help to generate public demand for healthy food through strategies such as earned media (media coverage generated through press releases, news items, etc.)
- Use innovative social marketing techniques to market healthy food procurement policies to the public to help citizens recognize their importance and potential health benefits
- Educate the public on the value of healthy food procurement
- Share success stories and best practices, as well as barriers and facilitators to healthy food procurement
- Empower citizens to advocate for healthy food procurement policies through training and capacity building initiatives (e.g. skill building in media advocacy)
- Serve as champions for healthy food procurement within their own institutions and as change agents

Continued on the following page

BOX 1 (continued)
Key recommendations

Citizens

We recommend that citizens:

- Make institutions and governments aware of their desire for healthy food procurement policies
- Advocate, as part of citizen groups and coalitions, for development of healthy food procurement policies

Researchers

We recommend that researchers:

- Broker knowledge of solutions through implementation and evaluation research, including filling gaps in knowledge (e.g. effectiveness of healthy procurement beyond the school context)
- Explore potential synergies of healthy food procurement policies with other societal priorities within a larger wellness policy framework (e.g. promotion of active transportation, employee fitness, institutional hygiene, etc.)

[a] While our aim is not to be prescriptive, we understand this work to be coordinated through the Office of Nutrition Policy and Promotion, Health Canada.

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At-a-glance

"A tough sell": findings from a qualitative analysis on the provision of healthy foods in recreation and sports settings

Jessie-Lee D. McIsaac, PhD (1); Sherry L. Jarvis, MA (1); Rebecca Spencer, MA (2); Sara F.L. Kirk, PhD (1,2)

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Abstract

Recreation and sport settings (RSS) typically promote health in the form of physical activity, but the healthfulness of their food environment is often neglected. We explored stakeholder perspectives on barriers to healthy food provision in RSS through telephone interviews with ten representatives from RSS across Nova Scotia. Three key barriers were identified: 1) cultural norms associated with food in RSS and the broader environment, 2) the persisting notion of personal choice and responsibility, and 3) financial implications of healthy food provision. These barriers challenge healthy food provision in RSS and require multi-faceted strategies to overcome social norms that undermine health behaviours.

Keywords: *food culture, health promotion, healthy eating, nutrition, recreation, sports, policy*

Highlights

- Cultural norms and values related to food provision in recreation and sport settings risk limiting the impact of interventions designed to support healthy food provision.
- Perceived opposition from patrons and accompanying concerns regarding loss of revenue among stakeholders are persisting obstacles, reinforced by a societal narrative that promotes personal choice as a primary driver for food provision.
- A multifaceted approach is needed to address the complexity of changing social norms and promoting healthy choices in recreation and sport settings.

Introduction

Around three-quarters of children in Canada participate in organized sports like soccer and swimming.[1] Recreation and sport settings (RSS)—a term that includes multi-purpose fitness centers, arenas, rinks, and sports fields—provide opportunities for such structured physical activity, as well as modelling other health promotion foci like injury prevention or smoke-free spaces.[2] Yet, paradoxically, the food environments within RSS often contradict overall health promotion messages through the provision of energy-dense, nutrient-poor foods that are quick to prepare and inexpensive to provide, yet profitable.[3-8] This apparent contradiction presents an opportunity for RSS to make improvements to their food environments to support health behaviours of the families that use them.[9]

Research from other provinces in Canada has identified barriers to healthy food provision within RSS, including financial concerns, the current food culture, and difficulty getting stakeholder buy-in[3,6] for changes in food provision. With the province of Nova Scotia having among the highest rates of chronic disease in Canada[10], and prior to the release of voluntary guidelines to support healthy eating in RSS (HERSS guidelines) within the province[11], we sought to qualitatively describe the barriers present within provincial RSS that may impact uptake of the HERSS guidelines prior to their release in October 2015.

Methods

We used Qualitative Description (QD) to describe the food provision experiences of ten key stakeholders from provincial RSS, as described in Table 1. Less interpretative than other methodologies, QD stays close to the data, permitting a summary of events *"in the everyday terms of those events."*[12] Participants were recruited from RSS via email using purposive sampling that focussed on those with the most insight into the factors that influences food provision within their RSS, such as facility or recreation managers.[13] The Dalhousie University Research Ethics Board approved this study.

Data collection involved individual semi-structured telephone interviews, lasting 45 to 60 minutes, on stakeholder experiences with food provision in RSS and perceptions about implementing healthy eating policies and practices. Data were collected between August and October 2014 and ended when no new data were emerging from interviews. Qualitative analysis software (QSR NVivo Version 10) was used for management and analysis. Open coding was conducted to inductively identify and define emerging codes, and an iterative approach was used.[14,15] Two authors (Jarvis, Spencer) developed the codes, portions of interviews were coded by each author to allow comparison, and all authors contributed to theme development to enhance credibility, authenticity, and confirmability.[12,16,17]

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TABLE 1
Participant characteristics

Facility/programming characteristics	Interview participant(s)	Community characteristics	Healthy eating policy/guideline status
Multi-purpose community centre that features an NHL sized arena, a competition-sized swimming pool, a water slide, a fitness centre and, a rock climbing wall.	Facility General Manager and Food and Beverage Manager	Rural town with over 12 500 residents	Facility policy (mandatory) that is similar to the HERSS voluntary guidelines
Recreation services and programming for the municipality, special events, policy development and overseeing facilities in their area	Municipal Recreation Manager	Rural Municipality providing services for over 60 000 residents	No policy; aware of the HERSS voluntary guidelines
Recreation services and programming for the municipality, special events, policy development and overseeing facilities in their area	Municipal Recreation Manager	Rural Municipality providing services for over 8000 residents	No policy; but have municipal guidelines that are similar to the HERSS voluntary guidelines
Recreation services and programming for the municipality, special events, policy development and overseeing facilities in their area	Municipal Recreation Manager	Rural Municipality providing services for over 70 000 residents	Municipal policy (mandatory) that is similar to the HERSS voluntary guidelines
Recreation services and programming for the municipality, special events, policy development and overseeing facilities in their area	Municipal Recreation Manager	Rural Municipality providing services for over 25 000 residents	Municipal policy (mandatory) that is similar to the HERSS voluntary guidelines
Recreation services and programming for the municipality, special events, policy development and overseeing facilities in their area	Municipal Recreation Manager	Rural town with over 4700 residents that also provides services for surrounding communities in the municipality	No policy; aware of the HERSS voluntary guidelines
A versatile convention, exhibition, sports and entertainment facility; a sports arena that accommodates special events.	Facility General Manager	Urban community with over 31 000 residents	No policy; aware of the HERSS voluntary guidelines
Multi-purpose facility that has arenas, gymnasium, fitness room, swimming pool and meeting rooms	Facility General Manager	Rural community servicing over 50 000 residents including surrounding communities	No policy; aware of the HERSS voluntary guidelines
Multi-purpose facility that has an arena, health and fitness centre, swimming pools and meeting rooms that accommodates special events	Facility General Manager	Urban community with over 67 000 residents	No policy; aware of the HERSS voluntary guidelines

Abbreviations: HERSS, healthy eating in recreation and sport settings; NHL, National Hockey League.

Results

Three key themes emerged related to the implementation of healthy eating within RSS (quotes presented in Table 2): 1) cultural norms associated with food in RSS and the broader environment; 2) the persisting notion of personal choice and responsibility; and 3) financial implications of healthy food provision. A summary of each theme is provided below.

Cultural norms associated with food in RSS and the broader environment

This was the most predominant theme, represented as the social norms and patron expectations of the types of foods that should be available within RSS. Unhealthy food traditions were viewed as being associated with certain sports, e.g. hockey and baseball, resulting in resistance to change toward healthier options, for fear that patrons would be unwilling to purchase them. The belief that patrons expected less healthy foods to be available at special events was typically framed within the context of being an occasional "*treat*." There were some types of sports, however, e.g. figure skating, dancing and soccer, that were perceived to be more open to healthier options being provided.

The persisting notion of personal choice and responsibility

This theme is illustrated through the tension participants described between supporting personal choice through food provision and the responsibility of RSS to be leaders in changing food environments. Most participants felt that staff within RSS should not be telling people what they can and cannot eat. Willingness to offer more healthful items was framed as being acceptable only alongside less healthy options, to allow patrons to make their own choice. The personal beliefs of participants about choice emerged in relation to their perception of the role RSS should play in creating healthy food environments. Participants expressed concerns that changes to the food environment to support health may be beyond the mandate of RSS. Rather than individual RSS being responsible for initiating changes to

TABLE 2
Themes and illustrative quotes

Theme	Quotes
Cultural norms associated with food in RSS and the broader environment	*"Baseball is probably the biggest barrier for nutritional change, uh, due to uh, I don't know, nostalgia, or food related items that are just attached to baseball culture such as hot dogs and chips and pop and pizza and peanuts and sunflower seeds."*
	"People weren't buying into it…the majority of people that come through here are hockey, hockey minded people…it's just, that's, that's the culture that's built around uh, around the sports…I mean, the NHL players, you see them on TV and they're promoting [sports drinks], and uh, and [Brand] Chips."
	"…like a big issue with the rinks is their fries. They love their fries… so, for me to tell them that they can't have fries anymore, well we might as well just close the canteen and shut the rink down, that's the end of it."
	"Like everyone's like, well celebrations are important, and we should have celebrations and there has to be, like, junk food at that function. Like, there just seems to be a real, a real unwillingness for a lot of people to just let go of that."
	"…yeah, hockey, hockey culture is certainly different than uh, say the figure skating…. Well, I mean there's a number of reasons uh, but it's just, it's a different sport, it's just like running is to uh, baseball. Uh, it's a different mindset…."
The persisting notion of personal choice and responsibility	*"I think people should be able to make the choice…. that's what I believe. I don't think the arena, okay, is the place, I don't think we're the ones responsible for making that decision for people. I think people have to be informed, you have to educate them on, they'll make that decision for me."*
	"…the provincial body of each sport has to instill that into their programmers, coaching staff and so on and so forth and then that has to be, because uh, I can only do so much as a facilitator, as a manager of a facility…"
	"… I don't think, most people who come to the hockey games are sitting down eating a box of poutine every night that they're home. So they come here and that's their treat, okay? ...So, I think, if I went the other way, I would see my revenue drop."
Financial implications of healthy food provision	*"And the marketplace will dictate everything…like, once the customer decides that, I'm not going to buy your French fries and hot dogs, then you won't be selling French fries and hot dogs."*
	"…selling something that's going to create a healthier community versus something that's going to cost, that could lose money, is a tough sell…people look at dollar value versus health value unfortunately."
	"…last year I gave it a real good kick at the can and the last year I hired an individual who's a very good chef … and boy, we gave it a real good shot but it uh, it just, it failed miserably."

Abbreviations: NHL, National Hockey League; RSS, recreation and sports settings.

support healthy eating, some participants felt that provincial sport or recreation organizations that provide overall direction for sport groups and facilities should be involved in leading change.

The financial implications of healthy food provision

This third theme represents the fear expressed by participants, particularly facility managers, that revenue would be lost if they sold healthier foods and/or stopped selling less healthy foods. Framed within the cultural context that less healthy foods were a "treat", despite their ubiquity, their provision was attributed to patrons wanting the less healthy options. Healthy foods were viewed as more costly, requiring more preparation time and different storage needs, and that waste would occur if the food did not sell. This was particularly salient for facilities that were not open every day, e.g. some arenas.

Discussion

Our findings reinforce the challenges facing health promoters in creating environments that support healthy behaviours. Allowing personal choice to dictate food provision, while preferred by participants in this analysis, has been found to limit the impact of changes designed to improve healthy food provision, which is particularly concerning in settings frequented by children and youth.[6] When healthy and unhealthy choices are available within RSS, children and youth continue to purchase primarily unhealthy options.[6,18] Further, our current unhealthy food culture makes the notion of personal choice a complex one because many social norms, learned behaviours, and expectations about food are strongly influenced by marketing campaigns of the food industry.[19,20] Adults are equally susceptible to selecting unhealthy foods, or wanting unhealthy foods such as hot dogs and fries to be readily available in RSS facilities.[21] This further highlights how the availability of unhealthy foods in settings like RSS is both normalized and entrenched.[22]

Consistent with other Canadian studies, participants perceived healthy foods to be more expensive to purchase, prepare and store, and overall less marketable than unhealthy foods.[2,4,5,23] Emerging evidence from a recent intervention study challenges this perception[24]. In this intervention, resources were provided to an intervention group to help them change the food and beverage environment within sporting clubs, while the control group received no support. No significant differences in annual revenues were observed following the intervention between the control and intervention sporting clubs,[24] indicating that the intervention group did not lose revenue as a result of selling

healthier options. This has also been found in research from Alberta.[23] Unhealthy food environments in RSS may be paradoxically an unintended consequence of improving accessibility to physical activity participation[25] with user fees for RSS services often being subsidized by food service revenues that are, in turn, heavily dictated by the social norms of RSS settings.[23] Ideally, physical activity and healthy eating should not be competing priorities in RSS to support overall health promotion goals but there remain obstacles to overcome the deeply entrenched values associated with food.

A strength of our study is the participation of stakeholders across different regions of Nova Scotia and diverse types of facilities with varying experiences of healthy eating initiatives. During the final stages of interviews and analysis there were no new emerging themes that developed, which suggested that we had sufficient representation of perspectives from stakeholders in the province. However, one limitation was the use of telephone interviews, as we may have missed important non-verbal cues that could have contributed to the analysis.

Conclusion

Our findings reinforce the need to address social norms that undermine health behaviours. This requires champions who can advocate for healthy eating and take action to overcome resistance to healthy eating guidelines.[5] Health promotion strategies that may support the implementation of healthy eating guidelines should also provide social supports, such as training and resources, and strategies that increase the availability and promotion of healthy foods, while limiting the marketing and advertising of unhealthy foods.[2,26] Emerging evidence reveals that interventions using a combination of these strategies have a greater impact on healthy eating choices and behaviours.[17,24] It is clear that a multifaceted approach is critical to address the complexity of changing social norms and promoting healthy choices in RSS.[21,27] Changes to food environments within RSS as a result of voluntary guidelines implementation will likely only be modest,[5] without greater attention to perceptions surrounding the cost of healthy foods and the social norms that continue to shape unhealthy food provision in these settings.

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Conflicts of interest

The authors had no conflicts of interest to report.

Authors' contributions and statement

SFLK and JDM conceived and designed the study. SJ collected the data and SJ and RS conducted the data analysis. All authors drafted and wrote parts of the manuscript, were involved in the interpretation of data and critically revising the manuscript. All authors read and approve the final manuscript.

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Status report

FoodReach Toronto: lowering food costs for social agencies and community groups

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Abstract

Toronto has the largest absolute number of food insecure households for any metropolitan census area in Canada: of its 2.1 million households, roughly 252 000 households (or 12%) experience some level of food insecurity. Community organizations (including social agencies, school programs, and child care centres) serve millions of meals per year to the city's most vulnerable citizens, but often face challenges accessing fresh produce at affordable prices. Therefore in 2015, Toronto Public Health, in collaboration with public- and private-sector partners, launched the FoodReach program to improve the efficiency of food procurement among community organizations by consolidating their purchasing power. Since being launched, FoodReach has been used by more than 50 community organizations to provide many of Toronto's most marginalised groups with regular access to healthy produce.

Keywords: *food security, food sustainability, food system, alternative food network, food procurement, healthy diet*

Highlights

- The objective of FoodReach is to provide community agencies with regular and predictable access to affordable, fresh food in Toronto.
- Food purchased through FoodReach is used to prepare meals and snacks for children, low-income families, people experiencing homelessness and other groups.
- These meals are often the only source of healthy food accessed by people within these communities in a day.
- In its first year (May 2015 to April 2016), FoodReach worked with more than 50 community organizations to improve their access to affordable produce.

Introduction

Food insecurity, defined as inadequate access to food due to financial constraints, affects approximately 2.2 million Canadians[1] and approximately 10% of Canadian households with children.[2] Food insecurity often accompanies other social determinants of health including poverty, unemployment and lower levels of education, and disproportionately impacts vulnerable groups such as children, single parent families, Canadian newcomers, and Canada's first inhabitants—Indigenous communities.[2] It is associated with a range of chronic health conditions including diabetes, heart disease, osteoporosis and obesity[3,4] and higher health care spending.[5] Household food insecurity is also associated with an increased risk of emotional and behavioural problems among children, which can have lasting effects throughout their lifetime.[6,7]

Within Canada, the prevalence of food insecurity varies considerably between municipalities.[8] Toronto has a food insecurity rate that nears the Canadian average, but because of its large population size, has the largest absolute number of food insecure households for any census metropolitan area in Canada. More specifically, of Toronto's 2.1 million households, roughly 252 000 households (or 12%) experienced some level of food insecurity in 2011-2012.[8] It is a problem that is growing rather than declining:[9] between 2008 and 2016 the food banks in Toronto increased in use by 12%.[10]

As is the case in many Canadian cities[11], Toronto tackles food insecurity through various mechanisms including charitable models (e.g. food banks), household support models (e.g. community gardens and community kitchens) and community food system models that seek to maximize partnerships to increase local food security.[4] In Toronto more than 1000 community agencies, 750 school-based Student Nutrition Programs (SNPs) and 900 child care centres serve millions of meals per year to some of the city's most vulnerable groups. Research undertaken by Toronto Public Health revealed that many community organizations face challenges accessing fresh, affordable food.[12] Typically, their food supply chains rely on small budgets, unpredictable donations, little negotiating power when entering contracts with large food service providers, and reliance on volunteers.

In 2013, as part of the *Toronto Food Strategy*, Toronto Public Health began

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assessing the feasibility of various systemic and sustainable models for improving the efficiency of food procurement and reducing dependence on charitable donations among community organizations. In 2015, the FoodReach initiative was launched as a collaboration between public, community and private sector partners to address this systemic problem.

The FoodReach initiative

The objectives of FoodReach are two-fold:

- To provide community agencies with regular and predictable access to affordable, fresh food. Through its Buying Portal, FoodReach aims to aggregate the collective purchasing power of its members, regardless of their size, to provide access to fresh produce at wholesale prices—a benefit which in the past was only available to large organizations.
- To strengthen the system that supports marginalised communities in Toronto. Through its Knowledge Exchange Portal, FoodReach also aims to enable agencies to share existing knowledge and resources in order to build systemic capacity in healthy food preparation at lower costs.

The Buying Portal

The FoodReach Buying Portal (www.foodreach.ca) is an online system through which individual community organizations can order fresh fruit, vegetables, dairy, eggs and bread from a variety of suppliers. The Buying Portal combines a user-friendly "front-end" food ordering website for community organizations and a "back-end" processing website for food consolidators (private businesses that sell food products to other businesses). Consolidators source fresh produce from the Ontario Food Terminal (OFT)—the main produce distribution centre for Toronto and third largest food terminal in North America—as well as local farmers, and deliver it to members the next day.

The ability to access fresh produce daily at wholesale prices from a public institution like the OFT is critically important to FoodReach. It is a one-stop point at which produce can be purchased, and then delivered. Given the number of consolidators working out of the OFT, it provides healthy competition and thus good prices. Another important dimension of FoodReach is that there is no delivery fee and a low minimum order requirement of only $50. This is important because many of the organizations working with marginalised communities are small scale and food is often not a major line item in their budgets. In some cases, it is not budgeted for at all. This has led to agencies serving unhealthy food—coffee and muffins for breakfast, as an example—to children, low-income families, people experiencing homelessness and other forms of marginalisation.[13] Yet, for many, this food is sometimes their only source of food for the day. FoodReach attempts to provide agencies with a cost-effective source of better food.

The Knowledge Exchange Portal

FoodReach's Knowledge Exchange Portal aims to provide a platform for community organizations to collaborate, share resources and menu ideas, access training materials, and learn more about healthy diets and the local food system. This is especially important because many of those who buy and prepare food within community organizations are untrained cooks who serve meals on limited budgets. It is also an attempt to 'knit together' a large community of organizations who, despite being united by similar missions, tend not to collaborate sourcing food or delivering meal programs.[13]

The Knowledge Exchange Portal has been designed to increase organizational confidence, knowledge, and motivation to encourage healthy food purchasing, healthy meal preparation, and ultimately to facilitate lasting behaviour change among community organizations that provide meals to vulnerable populations in Toronto.

A new and more interactive knowledge exchange portal was launched in December 2016. It works in tandem with a renewed social media campaign that both informs agencies of what FoodReach offers and provides useful information, like what fresh produce is peaking in price (and so should be avoided), and what a useful substitute is.

Operations and governance structure of FoodReach

FoodReach is a social enterprise that brings together public, private and government organizations, and is incorporated as a not-for-profit organization.

FoodReach is governed by a small board of directors comprising the City of Toronto, Student Nutrition Toronto, the Parkdale Activity-Recreation Centre (PARC)—an NGO that works with members on issues of poverty and mental health—and a key community stakeholder, STOP Community Food Centre. Figure 1 presents a diagram of the governance structure of FoodReach.

An Operations Committee—responsible for implementing FoodReach's day-to-day activities—was established in late August 2016. FoodReach also continues to call on external advisors and partners to provide regular insights that enable FoodReach to refine their operations and social mission on a regular basis.

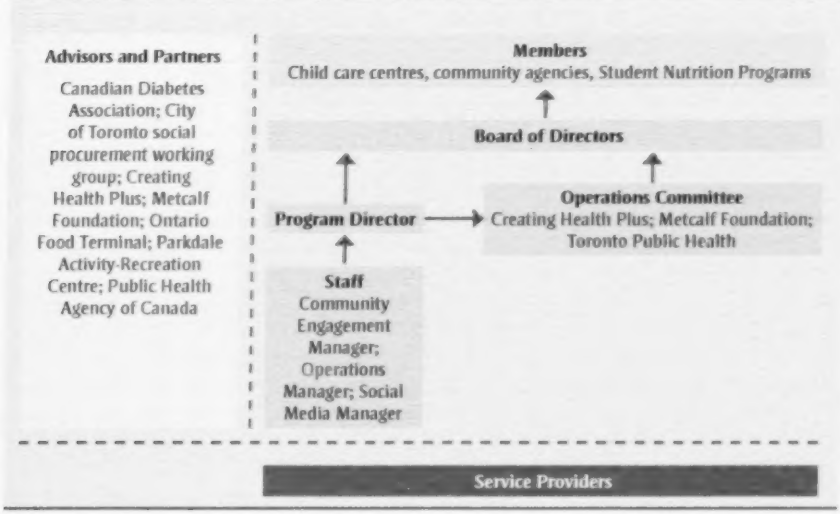
A lot of thought went into the kind of structure needed. The guiding principles were that it should provide a forum through which members can contribute ideas, a board that can ensure that funds are raised efficiently and that operations are carried out in the manner members desire, and an operations committee that works with a high degree of independence to grow the organization. Given that the initiative straddles public, private and civic space, the FoodReach governance structure works to ensure that all are represented, heard and understood.

Results (the first 21 months)

In its first year—May 2015 to April 2016—an average of 23 members placed orders through the FoodReach portal each month, ranging from one member in May 2015 to 39 members in November 2015. By comparison, an average of 42 members placed orders through FoodReach each month in its second year so far—May 2016 to January 2017, fluctuating from 40 in May 2016 to 57 members in January 2017 (Figure 2).

The total number of active members—those regularly ordering through FoodReach—has grown consistently. A sharp increase in activity is evident from September 2016, which corresponds with FoodReach hiring three new members of staff, bringing a second consolidator on board, and starting to serve both SNPs and child care centres. As the new project manager, Alvin Rebick, explained in a December 2016 interview, this "is really the point when we moved away from pilot to full implementation. Although we are still learning and there are still problems, we

FIGURE 1
The governance structure of FoodReach


Advisors and Partners
Canadian Diabetes Association; City of Toronto social procurement working group; Creating Health Plus; Metcalf Foundation; Ontario Food Terminal; Parkdale Activity-Recreation Centre; Public Health Agency of Canada
Members
Child care centres, community agencies, Student Nutrition Programs
Board of Directors
Program Director
Operations Committee
Creating Health Plus; Metcalf Foundation; Toronto Public Health
Staff
Community Engagement Manager; Operations Manager; Social Media Manager
Service Providers

are now better equipped to deal with them." Given the increasing rate at which active users are coming aboard, it is highly likely that by the end of year two FoodReach will, *minimally*, have doubled the number of agencies purchasing through its portal.

In contrast, total membership now constitutes about 10% of the approximately 2500 agencies that FoodReach was established to support. Over 200 members are now registered on the FoodReach portal but many are still not active users.

FoodReach's ongoing "implementation research"* has revealed that the hesitance in coming aboard is multi-faceted: many are simply reluctant to leave relationships with existing suppliers, others prefer the high touch relationships they currently have to an online system, while a few don't recognise any price advantage.

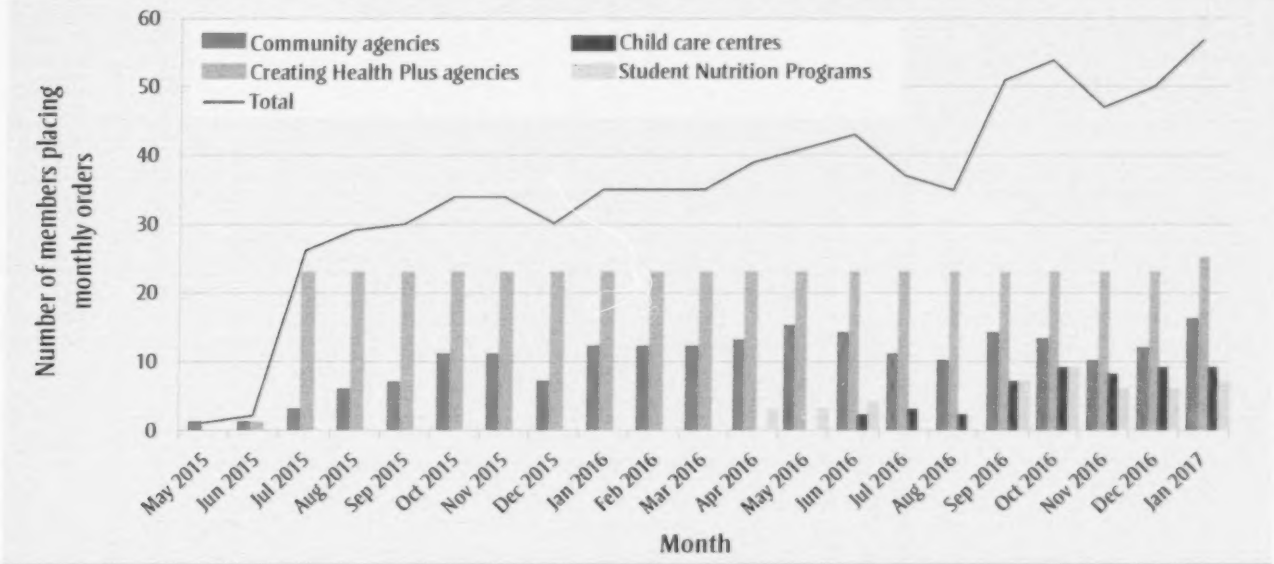
Most of all, the research shows that the major impediment is a lack of knowledge of what FoodReach offers. This seems to be borne out by the rapid increase in use *once a more systematic outreach programme* was adopted, problems with suppliers were resolved, and a more accessible website was launched.

Membership, and active membership, is important. But so is 'spend' per member. In order to attract private sector suppliers—who are important to long-term sustainability—the average spend per member must be attractive. This is challenging given that the reason FoodReach was established was because many of these agencies are so small that they cannot leverage economies of scale, and FoodReach's combining of purchasing power was an attempt to do so.

In May 2015, just one agency spent $490 through the FoodReach portal. In January 2017, 57 members spent $38 000 through the portal; a 75-fold increase in overall spend (Figure 3).

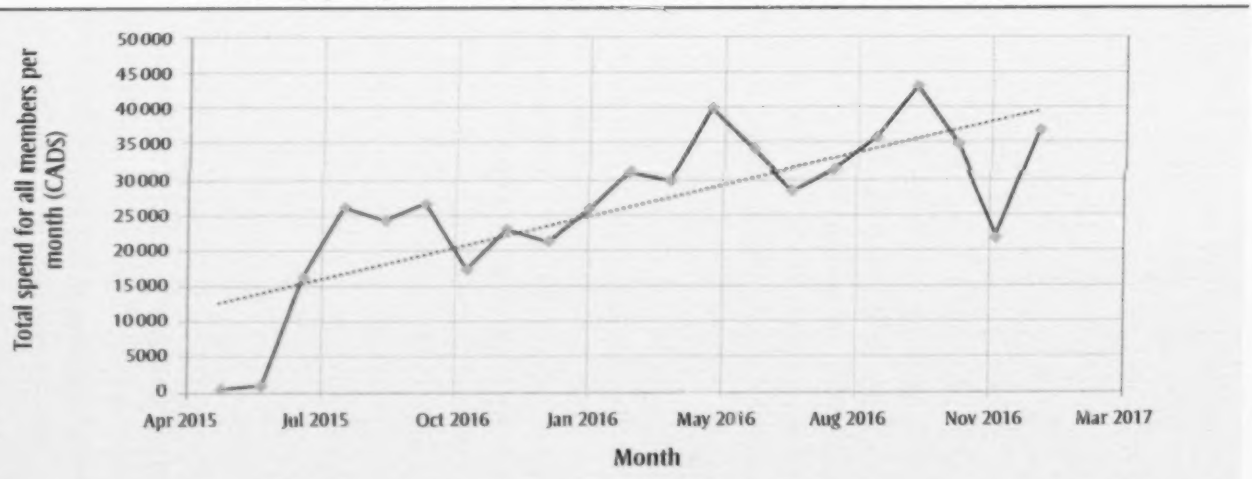
Average member spend has also increased from $490 to about $670 per month. In

FIGURE 2
Number of members ordering with FoodReach between May 2015 and January 2017



* FoodReach: Phase 3 report to PHAC (March 2017). Available upon request.

FIGURE 3
Total monthly spent by all members through FoodReach between May 2015 and January 2017



October 2016, 54 members spent $43000—almost $800 per agency—through the portal, the best per month spend so far for FoodReach. Late 2016 showed a dip in sales, due to the increase in food donations received by community agencies and the closure of schools. Data from January 2017 indicates that sales have returned to their pre-dip levels, and are increasing again.

Successes and challenges

To help inform the initiative, FoodReach conducted implementation research to document challenges and opportunities that community organizations face when buying fresh produce. The early 2016 research—using a mixed-methods approach that incorporated both qualitative and quantitative data collection, and approved by the Toronto Public Health Research Ethics Board—included a series of 17 user and non-user interviews. These interviews were run again in late 2016 to track how users rated FoodReach, and what was keeping non-users from participating.

From these interviews, the program learned that member organizations most valued the 'quality and freshness of produce', while the free next-day delivery and small minimum orders were viewed as the biggest advantages of using FoodReach. The latter was especially important for the many small agencies with limited storage space.

Most organizations using FoodReach liked the idea of an online buying portal to purchase fresh produce, but a number spoke of the buying portal as a little alienating. This was, in part, due to a preference for talking directly to their contact via telephone. It was also due to FoodReach's design—a double sign-in—and confusing labelling by consolidators which led to buyers being unsure of prices and quantities being offered. Both of these problems have now been addressed.

Organizations reported that FoodReach had increased the quantity and frequency of healthy food served in their meal programs. It had also simplified food preparation because, rather than having to make do with what they received in terms of food donations—which changed from day-to-day and, thus, made menu planning challenging, especially for the many untrained cooks—food deliveries were now predictable.

The issue of food prices and overall food costs was complex. Many organizations spoke of FoodReach reducing cost, both in terms of dollars spent as well as the amount of staff time needed to purchase and pick up fresh produce. But this issue requires further research, since several agencies did not consider—or budget for—travel time and staff time as part of the 'costs' of fresh food procurement. Agencies that did focus on overall cost of procurement and factored in time were more likely to offer 'reduced costs' as a benefit of the FoodReach program.[1]

Almost all agencies believed in FoodReach's broader social goals of increasing control of the food supply chain and improved knowledge exchange. However, most members found that the Knowledge Exchange Portal was underdeveloped and requested more information on seasonal pricing, nutritional information, preparing halal, and sharing menus, amongst other things. Agencies also expressed an interest in receiving rebates and a number of non-users believed they were too small to use FoodReach. Other agencies had long-term contracts in place with existing suppliers. These findings were incorporated into a re-design of the FoodReach knowledge exchange portal.

Through its initial implementation, FoodReach also encountered some barriers working with food consolidators. Historically, the majority of food consolidators received produce orders from community organizations by phone, and uptake of the FoodReach web portal was a technological challenge for some. In other cases, consolidators already had individual

[1] No hard numbers on FoodReach's impact on prices of food, or on the total costs to agencies of food procurement, are available. FoodReach is still investigating this. Initial indications are that FoodReach's prices are competitive but are likely to reduce the overall cost to agencies because of their just-in-time delivery, and the freshness of the produce provided.

online ordering systems in place and considerable financial resources were required to enable compatibility of these systems with the FoodReach portal. This unexpected challenge has consumed a lot of FoodReach's time and budget, and continues to be an area of significant work.

Future directions

Prior to the development of FoodReach, community agencies sourced food for meal programs through a range of mechanisms and consolidators, mostly in isolation. By bringing agencies together, FoodReach aggregates and leverages the collective purchasing power of community organizations to obtain wholesale pricing on fresh produce and improve the efficiency of delivery. Not only does this program help lower food *costs*[‡] in many cases, it also seeks to improve nutritional quality of meals, build communities, provide educational material, connect producers to consumers, and provide members with the opportunity to take control of the local food system.

The ability of the FoodReach program to deliver these opportunities is expected to increase as the program matures, with the expansion of human resource capacity, continued negotiations with food consolidators, and continued and increased participation by community organizations, municipal government and student nutrition programs.

Two other important food security initiatives currently being discussed by Toronto Public Health's Food Strategy group demonstrate the potential power of the FoodReach idea. Toronto Community Housing is considering establishing community food buying clubs, and Toronto Public Health is discussing the idea of social supermarkets for low-income neighbourhoods. Both would benefit from having FoodReach as a potential buying portal through which they can access fresh food at wholesale prices.

Furthermore, the development of the Knowledge Exchange Portal will offer new features to community organizations, such as training programs, information on substituting food items for healthier options, and information on seasonal pricing. It is anticipated that these new features will support community organizations by providing skills and knowledge to take control of the food system. Finally, FoodReach is refining its website to include analytics that will provide FoodReach and Toronto Public Health with the ability to monitor the impact of the program over time and document improvements in the quantity and quality of food served in community meal programs.

Discussion

Since its launch in May 2015, FoodReach has helped consolidate the food purchasing of over 50 community organizations working to address food insecurity in Toronto by providing healthier meals to the hungry. It has grown steadily, but slowly, often because knowledge of what it offers has not been understood by its target agencies. Since September 2016, when several permanent staff came on board, this has changed and FoodReach's growth trajectory has turned sharply upwards.

The "catch 22" issue of leveraging good wholesale pricing is that it requires volume (in other words, more agencies participating), yet to get the volume it needs good pricing. This is an issue that FoodReach has addressed and in 2016 they brought aboard child care centres en-masse. This has been an important factor in FoodReach's recent growth (see Figures 1 and 2). It is currently in negotiation with the City of Toronto's social procurement division to become a supplier there. This will also bring on a large number of agencies. According to FoodReach, the prospects for growth are good.

During its next phase of development, FoodReach will focus on growing its client base (i.e. community organizations that purchase food through the program), establishing a sustainable funding model, and refining its Buying Portal and Knowledge Exchange portal to further support community organizations.

Few studies have explored the ability of programs like FoodReach to support the needs of vulnerable populations relying on community organizations and student nutrition programs (which are under pressure to reduce costs) to access the food they need. It is also unclear what impact FoodReach, and other programs, have on addressing household food insecurity and poverty. Initiatives like FoodReach fit within Collin's proposed conceptual framework for household food insecurity action as a type of "community food systems model."[11] These types of municipal initiatives aim to maximize community self-reliance by building partnerships among governments, food champions, and service providers.

Despite growth in recent years, there is in general a lack of systematic evaluation for these initiatives.[11] More research is needed to understand whether programs like FoodReach increase food security for individuals and communities. Initial qualitative findings from FoodReach suggest that community organizations benefit from the ease, quality, and price of produce offered by the FoodReach program, but longer term evaluative studies are needed to better understand the impact on household food insecurity.

The FoodReach program not only supports community efforts to reduce household food insecurity, but also supports healthy food procurement more broadly. In 2014, a number of Canadian health and scientific organizations identified the need for healthy food procurement policies that encourage consumption of fresh produce, take steps to ensure the affordability of healthier foods, and implement educational components to increase awareness, desire, and demand for healthier options.[14] Together these enable food systems change. FoodReach is just one way Toronto Public Health is helping community organizations achieve these healthy food procurement objectives.

Conclusion

Toronto Public Health's FoodReach program has helped consolidate the food purchases of over 50 community organizations working to address food insecurity in Toronto by providing meals to the hungry. This program may be an effective way of supporting community action to alleviate food insecurity and promote healthy eating, and research is ongoing to better understand FoodReach, the challenges and opportunities it represents, and its social and health impacts.

[‡] FoodReach sees food prices and food costs as different. Because of very low margins on food prices, FoodReach aims to simply remain competitive. However, its service does provide ways in which overall food costs for agencies can be lowered.

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Conflicts of interest

The authors had no conflicts of interest to report.

Authors' contributions and statement

PC and JG were primary researchers/evaluators/writers; BE was Project Manager, and MG and HO, both from PHAC, provided funding and critical comment.

The content and views expressed in this article are those of the authors and do not necessarily reflect those of the Government of Canada.

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Building capacity through urban agriculture: report on the askîy project

Wanda Martin, PhD, RN; Lindsey Vold, BSN, RN

This original qualitative research article has been peer reviewed.

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Abstract

Introduction: Many North American cities have a built environment that provides access to energy-dense food and little opportunity for active living. Urban agriculture contributes to a positive environment involving food plant cultivation that includes processing, storing, distributing and composting. It is a means to increase local food production and thereby improve community health. The purpose of this study was to understand how participating in urban agriculture can help to empower young adults and build capacity for growing food in the city.

Methods: This was a qualitative study of seven participants (five Indigenous and two non-Indigenous) between the ages of 19 and 29 years, engaged as interns in an urban agriculture project known as "askîy" in Saskatoon, Saskatchewan, Canada in 2015. We used a case-study design and qualitative analysis to describe the participants' experience based on the sustainable livelihoods framework.

Results: A collaborative approach had a great effect on the interns' experiences, notably the connections formed as they planned, planted, tended, harvested and sold the produce. Some of the interns changed their grocery shopping habits and began purchasing more vegetables and questioning where and how the vegetables were produced. All interns were eager to continue gardening next season, and some were planning to take their knowledge and skills back to their home reserves.

Conclusion: Urban agriculture programs build capacity by providing skills beyond growing food. Such programs can increase local food production and improve food literacy skills, social relationships, physical activity and pride in community settings.

Highlights

- The askîy project provided participants with opportunities for knowledge exchange on First Nations culture.
- Interns spoke of future jobs, improved communication and interpersonal skills, confidence in their bodies, setting goals, improved attitude towards food, diet changes, and valuing of nature and strong social ties.
- One of the challenges was finding space to grow with access to water and electricity.
- The program builds capacity in young adults by providing a venue to apply local First Nation knowledge, creating a safe space for mistakes, introducing new ideas, allowing for self-directed learning, and providing participants with marketable skills.

Keywords: food security, urban agriculture, self-reliance, resilience, capacity building, social capital, social cohesion, sustainable livelihoods framework

Introduction

Urban agriculture is a community health intervention with the potential to increase local food production and to improve food literacy skills, social relationships, physical activity and pride in community settings.[1] One such intervention, the askîy project, has been operating since 2014 through CHEP Good Food Inc., with partners from the Saskatoon Food Council and the University of Saskatchewan. The Mosaic Company and Indigenous and Northern Affairs Canada's Urban Partnerships Program have funded the askîy project. The project participants are young adults, identified as "interns," who plant and tend urban vegetable gardens for the summer. The interns chose the project's name, *askiy*, which is a Cree word for earth. The project supports personal growth and engages First Nation and non-First Nation young adults in urban agriculture, developing food-growing skills and entrepreneurial skills through selling produce at the Saskatoon Farmers' Market.

The purpose of this present study, which was unfunded, was to understand the effects on young adults of participating in urban agriculture, and to provide pilot data for further studies on advancing urban agriculture and a self-sustainable food economy. The objectives were to explore how this project could strengthen skills, knowledge, and ability in young adults by growing food in the city, and to learn the meaning of urban food production to those involved. It is our hope that the results of this study will help CHEP Good Food Inc. enhance their urban agriculture work with inner city young adults and improve urban agriculture projects in Saskatoon.

Defining the problem

With an anticipated five billion people living in urban settings around the world by the year 2025, experts are questioning our ability to meet the demand for nutritious

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food.[3] Currently, in Saskatchewan, 67% of the population lives in urban areas,[3] and the urban population is expected to rise with the City of Saskatoon, which is planning for a population of half a million people by 2023.[4] Planning is necessary to meet the increasing demand for nutritious food. Approximately 10% of the population (36 000 people) of the Saskatoon Health region identify as Aboriginal (First Nations and Metis peoples),[5] of which 70% are employed with an average annual income of $13 000.[6] Moreover, the core neighbourhoods in Saskatoon, such as Riversdale, are home to individuals and families of whom approximately 57% have incomes below $25 000 per year.[7] Public health nutritionists in the province estimate the annual cost of a nutritious food basket (basic healthy foods to meet recommendations from Eating Well with Canada's Food Guide) in larger Saskatchewan cities to be approximately $10 000 per year, leaving little money for other living expenses for those in the lower income brackets.[8] Given the anticipated growth in Saskatoon's population and the struggles lower-income households currently face, public health professionals can do more to build resilience in urban settings, particularly with the First Nation and Metis peoples population, by providing communities with tools for urban food production. This goal is in line with the City of Saskatoon's *Strategic Plan 2013–2023*, which speaks of the city's history of self-reliance and stewardship, and the fact that its residents "grow more food in the city."[4,p.31] This is urban agriculture.

Urban agriculture

Examples of urban agriculture include tending gardens in various places throughout the city, as well as keeping micro-livestock such as hens, rabbits and bees.[9,10] These activities involve civic participation in food system governance and offer an opportunity for food sovereignty within an urban setting. The food sovereignty movement recognizes political and economic power in the food system and is a critical alternative to the neoliberal model favouring market forces over health equity.[11] It refers to a process of expanding democracy to regenerate local, autonomous, healthy and ecologically sound food systems that respect the rights of people to decent working conditions and incomes.[12,13] Weiler and colleagues[14] describe how food sovereignty and health equity share an orientation to promote human thriving by equalizing access to power and the flow of goods through the food system. Urban agriculture provides opportunities for citizens to participate directly in their food system, gain a sense of power and control, and improve health.

Systems perspective

Quality food production is only one aspect of the health benefits of urban agriculture, as there are additional paths to sustainable livelihoods that can improve health equity, such as a healthy built environment and sufficient income.[1] Achieving quality food production and a healthy built environment involves a systems perspective. The concept of sustainable livelihoods has traditionally been used in rural settings and refers to different types of capital, or resources, that can aid in recovery from stresses or shocks.[15] To support sustainable livelihoods, public health professionals can consider the various sectors involved with the physical, natural, human, social and financial assets outlined in the British Department for International Development's sustainable livelihoods framework.[16] The World Health Organization has called for integrated policies and programs based on intersectoral collaboration that can ensure a healthy and sustainable food supply, improve social cohesion, and provide environmental and economic benefits to positively affect health equity.[17] Programs that integrate these sectors and also engage the whole system will be important indicators of success in working toward improved urban health.

The sustainable livelihoods framework consists of the five assets touched on above—physical, human, social, financial and natural. *Physical assets* include basic infrastructure within the urban setting, including water supply, transportation and access to information.[16] The physical assets in a city can help to inform the way citizens think about where they live and influence feelings of pride and self-respect, further contributing to the overall perception of good health. *Human assets* include the knowledge, skills, ability to labour and good health that allow people to pursue a livelihood.[16] *Social assets* involve networks and connectedness that foster cooperation.[18] Specifically, this includes community engagement, inclusiveness and neighbourhood stewardship.[16] *Financial assets* are the cash or equivalents that are available to adopt livelihood strategies.[16] These tend to be the least available to those who have the most to gain from improving health equity.[19] *Natural assets* in urban agriculture are those that increase exposure to outdoor physical activity (such as green space), providing major health benefits.[20] Improving natural assets in the urban environment is essential for a healthy population now and in the future.

The askîy project

Working in Saskatoon's downtown core neighbourhoods, the askîy interns transformed a brownfield site* using over 300 containers for planting. The interns applied for four months of summer employment in an urban garden with the aim of developing food production skills, leadership skills and marketing skills at a local farmers' market. Faculty at the University of Saskatchewan College of Agriculture and Bioresources and staff at CHEP Good Food Inc. provided regular support and informal education through hands-on learning. Two interns had some prior knowledge of gardening, and took the lead in mentoring their peers. The interns employed a collective leadership style that encouraged group problem solving. They named the space *kiscikânis* ("garden" in Cree), and produced a wide variety of vegetables and herbs, flowers and traditional tobacco plants. The purpose of the project was to educate and empower community members with the necessary knowledge and skills to create a self-sustainable food economy through urban agriculture.[21] The majority of the interns had no prior gardening knowledge, but successfully engaged in the project to grow and sell produce. They also shared their developing knowledge with others, including new Canadians.

Method

We chose a case-study design for this study. We used qualitative thematic analysis with multiple coders.[22] A case-study design is preferred when asking "how" or "why" questions.[23] This study consisted of one-time, open-ended, one-hour interviews with all seven of the interns from the intervention project. While a focus

* A brownfield site is a previous industrial or commercial site that may be chemically, physically or biologically contaminated.[24]

group would capture the dynamics of the group, individual interviews allowed participants to consider and express the meaning they made of being engaged in the summer internship program. We obtained ethical approval from the University of Saskatchewan Behavioural Research Ethics Board. The program coordinators informed the interns of the opportunity to participate, and arranged a time and place for the interviews. We emphasized the voluntary nature of the interviews, and all the interns were engaged in the process. We used pseudonyms in this report to personalize the interns' quotations.

The audio of the individual interviews was recorded and transcribed for analysis using NVivo 11 qualitative software (QSR International Pty Ltd., Melbourne, AUS). To explore the effects of participating in the intervention project, we read the transcripts and thematically categorized the data to provide an overall description of the experience of participating in the askiy project. We clustered concepts to identify themes and compared emerging themes to the sustainable livelihood framework.[16]

We compared the findings to the sustainable livelihood framework as a means of capturing the original purpose of the askiy project, i.e. to create a self-sustainable food economy through urban agriculture. The purpose of this study was to complement the askiy project by explaining the participant experience within urban agriculture and identifying limitations to advancing a self-sustainable food economy. The resulting findings and gaps are driving additional sampling and research projects related to the creation of self-sustainable food economies through urban agriculture.

There were originally eight interns in the askiy project, but one moved prior to our data collection. The remaining seven agreed to be interviewed. The age range of those interviewed was 19 to 29 years. Five participants were of First Nations or Métis heritage, and two identified as Caucasian. Five participants were either University of Saskatchewan students or had recently completed their educational program. Their programs of study were education, arts and science, chemical engineering and renewal resource management. Two of the participants were parents. Three participants had previous gardening experience, but none expressed confidence in their gardening abilities at the beginning of the program, identifying themselves as beginner gardeners.

Results

The meaning of urban agriculture

While not specifically part of the sustainable livelihood framework, we were interested in the meaning of urban agriculture for the interns and in the integration of First Nation knowledge into the askiy project. Participants emphasized that urban agriculture produced quality, healthy food while making use of available space. To these participants, urban agriculture was about discovery, flexibility and the creation of green space in an urban centre. One participant, Kara, considered urban agriculture beyond the physical, something contributing to their spirituality. She said:

> It's like a big giant tree with all these roots, and it's all connected. That's what I'm finding about, is that we're all really so connected, and the great thing about urban agriculture is that in this modern society we can be so disconnected from our earth and to the bigger picture, and you can kind of find the middle ground with urban agriculture because you know the city makes it loud, busy, but then you can find this moment of peace, and you're like, in the garden and, I find it's very spiritual.

For Kara, the opportunity to engage with the soil and the process of growing meant more than just producing food. Gardens allowed for participation and realization of local knowledge and a reconnection to the land.[15] Memory and daily acts of gardening represented a greater connection to traditional knowledge and culture. Growing vegetables acted as a catalyst in reconnecting to First Nation ancestry and the earth by growing traditional plants (e.g. tobacco) and being close to the ground, smelling the soil, and nurturing plant growth.

First Nation knowledge

The interns lead the integration of First Nation knowledge into the project. The team brought the Cree language into the project and incorporated traditional methods into kiscikânis, such as planting in a circle with four openings, one for each direction. Another participant, Tammy, explained that the openings are "so each grandfather and spirit can come in, and join the ceremony." The team invited community elders to the gardens to bless the land, and others sought First Nation knowledge and teachings from their family members and elders living on their home reserve. They also learned that it is important to have positive thoughts and positive energy when planting and to talk to the plants because every plant has a spirit. It is through that expression of love that the interns spoke of feeling more connected, more confident and happier.

Additionally, they planted some native species, and ceremonial tobacco. Tobacco is important because First Nations people use it in ceremonies as well as giving it as offerings. Ana, another intern, explained that tobacco is "used in ceremonies as well, or if you are asking an elder for knowledge or going to a medicine man, or going to a sweat, and whoever is leading the sweat you give that offering, which is usually tobacco." Being part of the askiy project, with its strong First Nations lens, provided the interns with opportunities for an exchange of knowledge that is a vital part of cultural rejuvenation. Donna noted:

> I've never experienced a blessing before, so that was really great to see. We went to a powwow, I have been to a powwow before, but I've never been that involved in one before. So a lot of it is new to me, it's really interesting, I'm learning a lot.

The interns expressed that the exposure to the applied Traditional knowledge was a significant outcome of this project that all of the participants will carry with them. For some participants, the askiy project was the perfect combination of time, place, and mode to help them see the world from a First Nations perspective.

Growing food—physical assets

The main challenge in this project was finding a space to grow food safely. For example, vacant lots may be vacant because of contamination issues. The team settled on a neighbourhood brownfield because there was insufficient alternative growing space. They planted their plants in 323 plastic barrels, cut lengthwise,

and placed on wooden pallets to avoid contaminated soil.

Water was also a significant challenge. The interns underestimated the heat retention of the plastic barrels, which required more watering than in-ground gardens, and which had to be done by hand. The unused site had no water access, so the team purchased a large water tank that members of the Saskatoon Fire Department filled voluntarily. The tank required a water pump, which in turn meant the garden needed electricity, leading to the purchase of a battery. At each challenge, the team worked to find a solution.

Access to information is also a physical asset. The team expressed that a generation gap had resulted in knowledge being lost, as described by Ana:

> I didn't grow up in a family that taught me how to garden, or you know, didn't have gardens, my grandma had flower beds and stuff, but she never grew food. So, I didn't really know how to grow food.

Growing food was not common when the interns were growing up, and they did not know where to go to learn how to do it, or to get mentorship. However, they did find knowledge resources through the Internet. When asked what would be helpful to bridge the knowledge gap, James suggested developing a resource kit or workers' co-op with a focus on growing food, where people could feel comfortable accessing information and resources. Access to information, for James, was every bit as important as physical access to land and water, and adequate support for trying something new.

Personal growth—human assets

The opportunity for self-discovery can be a great asset. Many of the interns had no previous experience with gardening, or at least gardening was not common practice in their family. The participants reported increasing their knowledge of growing food, they expressed concern about where their food comes from and how it is grown, and they talked about changes in their attitudes towards food. They were beginning to value local food. This may be because the interns came to the realization that significant labour goes into growing food, or because of the taste of locally grown food and the growing community of people interested in local food in Saskatoon.

Participants commented on how the project had changed them. They spoke of future jobs, better communication skills, interpersonal skills, confidence in their bodies, setting goals, attitude towards food, diet changes and their values. Kara commented:

> A few months before I got the internship I started implementing a healthier diet, I started working out a bit more, so I was a little bit more healthier when I started. And then, this just sort of snowballed when I got the job. Because obviously you're working outdoors, it's a very physical job, and then once you see that growth, you think, oh wow!

The interns' sense of pride and accomplishment came through powerfully in the interviews. Improving participants' conceptualization of health may be associated with the restorative effect of urban gardening and urban green space through increased well-balanced lifestyle choices, engaging in physical activity, and self-reported decreased mental stress.[26]

The personal growth experienced by participants appears to be quite emotionally compelling. Doug found the experience particularly transformative. He said:

> It's pretty humbling to know that, you know, I've just started gardening when I'm 25, or 24 was when I started, and I only have a certain amount of harvests left. And I probably think my life in terms of years, but I think more so now I think in terms of harvests, and so I've probably like, if I was to garden until I was 70 say, for example, I have like 45, or 50 more batches of my salsa.

Doug, like others in the group, has changed the way he views his life; he now thinks in terms of harvests and not in years. Learning about growing food, working out the daily logistics of gardening on a brownfield, marketing the produce, and working in a team setting offered these participants a rich experience that may affect and even shape their future.

Effect on others—social assets

The participants shared the garden experience with others in the community by way of a group serving new Canadians. This association was mutually beneficial, because the participants received help with planting and harvesting, while the new Canadians had a way to meet people and practise speaking English. Similarly, First Nation and non-First Nation participants also experienced these cross-cultural interactions. Participants experienced mutuality and trust in spite of cultural differences. Community gardening brought diverse people together.

The social interaction and exchange of ideas was a highlight for this group. Not only did they learn gardening skills and marketing skills, but also, and more importantly, they learned to work as a team and to value their different strengths. One intern commented about his previous jobs and the difference in this experience. When asked about what he would be taking away from this project, Jeff said:

> Definitely the ability to work as a group. Yup, cause in most of my other jobs, it wasn't so team based. You know, you're kind of on your own, or there's someone telling you what to do. So this, it was interesting for me, cause I've never really worked in a group setting like this. Like where everyone's voice mattered, and where it was like a universal decision, instead of just one person making the decision.

We attribute some of this sense of cohesion to the leadership team. Doug noted how he has grown in his leadership style, from acting like the "boss" to working more from a positon of respect. Doug explained:

> [Telling people what to do], that doesn't go over well, maybe it worked for, for another generation but I think for millennials you kind of have to, you kind of have to give respect to get it, and people need to be people.

Doug was conscious of wanting respect from the team, and that meant being the first one on site, and working hard, listening to others and showing respect for everyone's ideas and contributions. Both team leaders had the same philosophy

and fostered an atmosphere that feeds a caring team approach.

The social assets of the askîy project are evident. Working together, being receptive to people in the neighbourhood and being open to including other groups made this experience particularly rich.

The business of growing and selling food—financial assets

Some interns noted that selling vegetables at the Saskatoon Farmers' Market was profitable, but there was no discussion about the larger costs of labour to produce the food, or costs of inputs, such as compost, water and electricity. There was no cost-benefit analysis at the time of the interviews. The interns did not measure benefits in terms of money, but in knowledge gained, which they could translate to other communities, and in the richness of their relationships with one another. The project was not self-funded, and therefore did not rely on making a profit from sales. The question remains whether urban agriculture can be a viable business for young adults who are new to this activity. The lack of discussion about the finances may have been due to a lack of education on this aspect of food production as part of the project. The value of the project to the interns at this point lay much more in gaining the knowledge to share. Tammy noted:

> I wouldn't sell it for a lot. Like even, 'cause like, I'm all about taking this knowledge back home to help my community, and there's people out there who don't have tons of money, like to actually buy all this fresh produce and stuff, or even just by donation. Making this, like, I wouldn't sell it for a lot.

Jeff recognized the need for a grant for start-up costs if they were to make this a viable business, thinking that for the first three years, participants would need extra support. Ana and Donna identified how tough the food-growing business is, and even though many farmers appear happy, many are discouraged, indebted people who experience a lot of stress. The interns spent some time with a market producer and witnessed the barriers small-scale producers face beyond physically working the soil.

Future job prospects may be open to the interns, based on their unique summer experience. When asked if being involved in this project would help to get a job in the future, James said:

> Probably, yeah, I would hope so, because there has only been dish-washing on my résumé. Agricultural intern on there, I think that would kind of make people want to know more about what I did here.

While the project does not support financial gain, marketable skills may be a financial asset.

Working out of doors—natural assets

Participants talked about the natural assets and expressed how good it was to be working out-of-doors. They also talked about the insects, whether pests were eating the plants, or if they were seeing beneficial insects. Ana described the increase in insects this way, as "biodiversity, so like, our garden, it's attracting a lot of butterflies and bees, which is really awesome." The interns mentioned other natural assets such as the reduction in the island heat effect, recycling of food waste into compost and potential for rainwater catchment to reduce storm water run-off.

Urban gardens serve as a collective space for transferring knowledge and cultural traditions and for producing socioecological memories of how to grow food and successfully navigate through the challenges of growing.[27] Overall, urban gardens and ecosystems provide a long roster of critical services affecting socioecological health and well-being in urban centres.

Discussion

The objectives of this research were to understand how the askîy project could build capacity in young adults growing food in the city, and to explore the meaning of urban agriculture to the intern participants. The interns commented that they were proud of what they had achieved in seeing the project through to the end. They spent time learning to grow plants, feeling connected to the land, and going back to their roots while creating something green, beautiful and useful. They were doing something that could help their community; and it required physical activity in sometimes challenging conditions; but in the end, they felt empowered. These participants demonstrated that the hard work of gardening can develop life skills, and that the rewards are worth the hard work.

Learning moved beyond the urban setting. Participants that were from or had connections to reserves commented on the lack of fresh food available there due to the expense of shipping produce to remote areas. Because of their involvement with this project, they realized there was a need in their home community that they wished to address. One intern talked about having the support of the others to create a community garden at home. They also noted how a garden might be a valuable asset for isolated communities, as well as for urban dwellers without yards, low-income families or new immigrants. This is similar to what Gray and colleagues[28] found in their study on the role of home gardens, in which they described how new gardeners wanted to share the beauty of producing and consuming fresh vegetables after learning about how to do it themselves.

All of the participants in the askîy project noted how gardening could lead to social change. Ana said that the urban agriculture movement is a "social movement in a positive direction." Some participants talked of gardening as a type of resistance to an industrial food system. It allowed for examination and critical reflection of the mainstream food system. This is not a new finding, but consistent with Hansen[29] who discusses how community gardens can be a site of resistance to the global food system. This practice of local food sovereignty gives people a sense of power and control, and the notion of ownership in a democratic space where people share social, environmental and economic goals.[29] Gardens can be a focal point for community members to come together recognizing what they can accomplish with collective power.[30] As the forces of globalization and an increasingly individualized society press down upon us, communities and communal gardening can be a source of identity and social cohesion. As an area for recreation, the community garden becomes an extension of social processes that contribute to identity in terms of where we live.[31]

Although we did not use an Indigenous approach to guide our study, the application

to the program reflects the values of the interns and their capacity to bring First Nation knowledge into their summer internship. The askiy project helped to build capacity in young adults by creating an opportunity to apply and share First Nation knowledge, creating a safe space for mistakes, introducing them to new ideas, providing the opportunity for self-directed learning and teaching them marketable skills. This particular approach to an urban agriculture project is very important to its overall success and sustainability. The home gardening program described by Gray and colleagues[28], for example, flourished when they employed an asset-based approach. When the organization running the program switched toward participatory development, more gardeners took ownership and worked to solve local problems while developing local leadership. The askiy project exemplifies an asset-based community development approach. For example, CHEP Good Food Inc. does not measure the outcome in kilograms of produce, but in the sharing and relationships that will remain with the interns over their lifetime.

Urban green and garden spaces are physical assets and can improve urban sustainability providing healthy infrastructure and food to citizens locally, thereby decreasing the reliance on externally produced services and the city's ecological footprint.[32] We view urban gardens as an integral part of city infrastructure. Urban gardens are a community asset, especially for those living in apartments or without space for a garden, providing a better quality of life. Practising gardening within city limits promotes open green spaces, encourages biodiversity, and builds communities.[33]

Vulnerabilities in the project do exist and are primarily economic. This is not only because they are not themselves financially sustainable, but also from a program-learning perspective, it does not teach economic management skills. In the future, the program designers could provide interns with information on the business of urban agriculture such as calculating start-up costs, maintaining a business and employing staff. Urban gardens may also be vulnerable to changes to zoning laws for land use or change in land title for development of other resources, extreme weather events, or political change. Social, human and physical resilience developed through urban agriculture demonstrate great potential for future research. Nevertheless, the social, human and physical resilience developed through urban agriculture has been clearly demonstrated, and these vulnerabilities present opportunities for improving such programs in the future.

Strengths and limitations

This study highlights the assets of an inner-city community with a focus on engaging youth and providing a venue for their voices. Further evaluation research can build on this work to strengthen and expand the askiy project. There are study limitations, however. The descriptive design provides a snapshot of what this project is about, but a phenomenological study could provide greater detail about the lived experience of interns working and learning together. The small group was very positive and there was critical information in the interviews. A critical perspective can help to identify areas of growth and improvement. We chose the Sustainable Livelihoods Framework after the interviews, so open-ended questions were not providing the depth of detail that more directed questions would solicit to address the framework fully. The study, however, did capture the meaning of the project, and helped to demonstrate to the interns the value of asset-based community development.

Conclusion

The main strengths of the project lie in its human and social assets, but all sustainable livelihood assets apply. The people who were part of this project in 2015 demonstrated great potential to take what they learned working with CHEP Good Food Inc. to share with their networks. Building local resilience and developing self-reliance are part of a vision for a better future. Creating community food systems helps people not only to produce food, but also to reconnect with nature and with their culture. The next step of this research will be to develop outcome indicators to measure the effects of similar gardening programs—indicators that reflect not only the outputs of gardening, but also social capital, knowledge translation and exchange, and personal empowerment.

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Conflicts of interest

The authors have no conflicts of interest to declare.

Authors' contributions and statement

WM designed the study and interpreted the data. Both authors contributed to the writing and the critical review of the manuscript, and have read and approved the final version.

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